













A  
TEXT BOOK OF MIDWIFERY  
IN THE TROPICS

BY

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**Dedication**  
**To the Alumni of**  
**Calcutta Medical College.**



## FOREWORD

The reception accorded to two previous books by one of us would seem to indicate that there is a growing demand for information as regards the clinical diagnosis and treatment of obstetric conditions in the Tropics, conditions which from the point of view of anatomy, climate and diet materially differ from those of the West.

Twenty years work at one hospital of one hundred and fifteen gynæcological and obstetrical beds, half of which are for Europeans and half for Orientals, has given one balance and deleted prejudice ; but even more important it has made it possible to try out, sift and gauge those lines of treatment most applicable to the East ; for no author, graduate or doctor relying on Western textbooks alone can appreciate how profoundly every problem of diagnosis and treatment is altered unless he has done an interne post in a woman's hospital East of Suez.

It has been our endeavour to remedy that defect and make it possible for the newcomer or graduate of Indian medical schools, to visualise obstetrics as he will meet the subject in private practice or hospital.

To many of our readers English is a foreign language ; therefore it has been thought best as in previous volumes to write in staccato style, for that we have found is a help to Indian students labouring under a long Western medical curriculum.

We have laid no stress on theory, but rather applied ourselves to those lines of clinical diagnosis and treatment

which have proved themselves best in the Eden hospital. Above all we have tried to instil the fact that the march of modern obstetrics must be arm in arm with the science of biochemistry and preventive medicine.

In every book of this nature there must be sins of omission and we are perfectly conscious that one of these is a lack or paucity of illustrations, but in this we act *ex cathedra*. We have done so on purpose in order to stimulate practical desire, manual curiosity and pathological keenness—embers which are apt to burn dimly in the average student.

Much of the material used and many of the views expressed have been published from time to time in the *Journal of Obstetrics and Gynaecology of the British Empire*, the *Clinical Journal*, and the *Indian Medical Gazette*. We have to thank the respective editors for permission to reprint them.

Finally, we wish to state that our object has not been to load the market with yet another volume but rather to give back to India before it is too late something which may help to lessen its great maternal and infantile mortality. That something, is knowledge which has been acquired by countless observations and findings over two decades in one large Indian clinic.

We have to thank Dr. M. Chakraverti most earnestly for the arduous task of reading the proofs, for without his assistance and enthusiasm, we doubt if we could have achieved anything.

CALCUTTA,  
October, 1932.

V. B. G.-A.  
P. C. D.

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## SECTION I—ANATOMY.

### CHAPTER I.

## THE PELVIS.

**Pelvis**—Bony cavity containing pelvic viscera, and constitutes the canal through which the child must pass in parturition.

Consists of four bones, sacrum, coccyx and two innomimates, and four joints, sacrococcygeal, symphysis pubis and two sacroiliacs.

#### MOVEMENTS OF THE JOINTS.

**Sacrococcygeal**—Coccyx may be pushed backwards in labour and thus the antero-posterior diameter of the outlet may be increased by 1".

**Sacroiliac**—Allows antero-posterior nodding movement of the sacrum on the ilia. This is utilised in Walcher's position which increases the antero-posterior diameter of the inlet by half an inch due to backward rotation of upper part of sacrum.

**Symphysis pubis**—Slight movement can sometimes be detected.

#### BONY PELVIS—Two parts,

1. **FALSE PELVIS**—Part above the brim, contains mainly abdominal viscera and takes no part in the mechanism of labour.
2. **TRUE PELVIS**—Part below the brim, through which the child has to pass in parturition.

**BRIM**—Formed by the pubic crest, pecten pubis, arcuate line of the ilium and the anterior margin of the base of sacrum.

True pelvis consists of,

1. **Brim**—Heart shaped in the male, oval in the female.
2. **Outlet**—Lozenge shaped.

##### Boundaries.

**Lateral**—Ischial tuberosities and rami of ischium and pubis.

**Anterior**—Symphysis pubis.

**Posterior**—Sacroiliac ligaments and coccyx.

3. **Cavity**—Space between the inlet and outlet.

##### Boundaries.

**Anterior**—Symphysis pubis.

**Posterior**—Sacrum and coccyx.

**Lateral**—Inner surface of ischium.

**PELVIC PLANES**

1. Plane of the inlet—Plane in relation to the brim.
2. Plane of the outlet—Plane in relation to the outlet.
3. Plane of greatest pelvic dimension—Passes through the junction between the second and third sacral vertebrae behind and the symphysis pubis in front.
4. Plane of least pelvic dimension—Passes through the lower end of sacrum behind and the lower end of the symphysis pubis in front.

**PELVIC INCLINATION**—Plane of the brim makes an angle of about  $60^{\circ}$  with the horizon.

To hold the pelvis in anatomical position—Sacral promontory  $3\frac{1}{4}$ " above the top of the symphysis pubis; the lower edge of symphysis being in same perpendicular line as the promontory of sacrum.

**PELVIC AXIS**—An imaginary line obtained by joining the middle points of a number of antero-posterior diameters of the true pelvis between the brim and the outlet. It is supposed to show the position of the centre of foetal head when passing through the pelvis.

**CHARACTERISTICS OF THE FEMALE PELVIS** as opposed to male.

1. More slender, lighter, muscular impressions less marked.
2. Depth of the cavity, less.
3. Breadth and capacity of the cavity, greater.
4. Inlet—oval (heart shaped in male). Nearly round in Oriental women.
5. Circumference of the brim—16" ( $14\frac{1}{4}$ " in male) in Orientals.
6. Sacrum—smaller and broader.
7. Sacrosciatic notches—shallower and wider.
8. Subpubic angle—wider; symphysis pubis—not so deep.
9. Obturator foramen—triangular (oval in male).
10. Outlet—larger.
11. Iliac crests—wider and more curved.
12. Joints—more moveable.

**Pelvic floor**—Soft structures which close the outlet of pelvis. Consists of,

- |                            |   |  |
|----------------------------|---|--|
| (1) PELVIC DIAPHRAGM . . . | { | Peritoneum.<br>Extraperitoneal fat.<br>Levator ani and Coccygeus muscles covered by fascia above and below.  |
| (2) UROGENITAL TRIANGLE    | { | Two layers of triangular ligament and Compressor urethrae.<br>Crura of the clitoris and the bulb.<br>Superficial perineal muscles.<br>Fascia of Colles.<br>Fat and skin. |

**PELVIC DIAPHRAGM**—Formed by Levator ani and Coccygeus muscles. Levator ani is formed by fusion of the two tail muscles, the Pubococcygeus and Iliococcygeus.

Pubococcygeus—Arises from the back of the symphysis pubis and is inserted into the median raphe between the—

- (1) Bladder and vagina.
- (2) Vagina and rectum.
- (3) Rectum and coccyx and to the tip and sides of the coccyx.

Iliococcygeus—Arises from the spine of the ischium and the posterior part of the white line and inserted into the coccyx and anococcygeal raphe.

Coccygeus—Arises by its apex from the spine of ischium and is inserted by its base into the side of coccyx and sacrum.

The pelvic floor when looked at from above is funnel shaped and at the apex of the funnel are the canals of the urethra, vagina and rectum. This perforated central area is the pelvic aperture. The fibres of the Levator extend downwards to within one inch of the hymen. Its enlargement causes hernia of the pelvic viscera or prolapse.

#### **Pelvic Fascia.**

It invests the muscles lining the pelvis and sends out processes to support the various viscera. It is composed of loose areolar tissue, continuous above with the subperitoneal tissue of the abdomen and consists of two parts, the parietal and visceral layers.

**PARIETAL**—Continuous at the brim with the fascia covering the Iliacus and Psoas; traced downwards it covers Obturator internus and ends in a thickened white portion, the *white line*, where it joins the visceral pelvic fascia. In its upper part the fascia passes backwards outside the internal iliac vessels, behind the pelvic mesocolon, behind the rectum in front of the sacrum and is continuous with the fascia on the opposite side; anteriorly it blends with the peritoneum at the back of the ascending pubic ramus and with the periosteum at the back of os pubis. The lower part forms the outer wall of the ischiorectal fossa. In the anterior part of the perineum it passes from the pubic arch as the posterior layer of the triangular ligament. The lower surface of the Levator ani is covered with a thin layer known as the anal fascia.

**VISCERAL**—Passes into the pelvic cavity, covers the pelvic surface of Levator ani and encloses the rectum posteriorly. Anteriorly it passes over the upper part of the vagina on to the uterus and is then continued at the sides of the bladder; finally, it goes in front of the bladder and forms its anterior true ligament. In the middle line it splits into three layers,—

- (1) Anterior—Vesical layer, forms the anterior and lateral ligaments of the bladder.
- (2) Middle—Rectovaginal layer, crosses between rectum and vagina.
- (3) Posterior—Rectal layer, passes behind the rectum and forms a loose sheath for it.

## CHAPTER II.

# FEMALE GENITAL ORGANS OF OBSTETRIC IMPORTANCE.

## VAGINA.

It is a canal extending from the uterus to the vulva; directed downwards and forwards and is almost at right angles to the axis of the uterus. Anterior wall  $2\frac{1}{2}$ ", posterior wall  $3\frac{1}{2}$ " long.

The cervix projects into its upper end and divides that part into four fornices—anterior, posterior and two lateral ones.

### RELATIONS.

**ANTERIORLY**, upper one inch is separated from the base of the bladder by loose connective tissue; lower  $1\frac{1}{2}$ ", urethra.

**POSTERIORLY**, Upper third—Pouch of Douglas and its contents.  
Middle third—Rectum.  
Lower third—Perineal body.

**LATERALLY**—Levator ani. The ureter is  $\frac{3}{8}$ " from the lateral fornix and is here crossed by the uterine artery.

### BLOOD SUPPLY.

Arteries, Upper third—Uterine.  
Middle third—Vaginal branch of inferior vesical.  
Lower third—Middle hæmorrhoidal and terminal branches of internal pudendal.  
Veins drain into the internal iliac veins.

### LYMPHATICS.

Upper two thirds—Iliac glands.  
Lower third—Inguinal glands.

### STRUCTURE.

Four coats, mucous, submucous, muscular and fibrous.

## UTERUS.

Situated in the pelvis between the rectum and bladder.

Pear-shaped, hollow, muscular organ with the apex pointing downwards and projecting into the vagina, lying at right angles to the axis of the brim of pelvis.

It is divided by a slight constriction into an upper part or body and a lower part or cervix. The constriction is the internal os and the opening into the vagina is the external os.

The part of the body within 3" from the internal os, at term, is known as the *lower uterine segment*.

Cavity of the body is triangular and that of the cervix is spindle shaped, in longitudinal section.

Portion above the entrance of the Fallopian tubes—Fundus.

Dimensions—Thickness 1"

Breadth 2"

Length 3"

Cavity  $2\frac{1}{2}$ " ; cervix 1", body  $1\frac{1}{2}$ ".

Cervix—Two parts,

(1) Supravaginal—Portion above the vagina.

(2) Vaginal—Portion inside the vagina.

## STRUCTURE.

(1) Mucous coat or endometrium, consists of,

(a) Epithelium—Single layer of columnar ciliated cells on a basement membrane.

(b) Glands—Tubular type in the body.

Racemose type in the cervix.

(2) Muscular—In non-pregnant state, it is difficult to distinguish the different layers.

In pregnancy, three distinct layers,

(i) Outer—Fibres are longitudinal.

(ii) Middle—Fibres are longitudinal.

(iii) Inner—Fibres are circular.

(3) Serous or the peritoneal covering.

## RELATIONS.

(1) Peritoneum—From the bladder the peritoneum is reflected on to the uterus at the junction of the body and cervix. It covers the anterior surface, fundus, the whole of the posterior surface of the uterus and upper 1" of the vagina and is then reflected on to the rectum, forming the pouch of Douglas. Two peritoneal folds pass from the posterior aspect of the cervix to the front of the 2nd and 3rd sacral vertebra; these are the uterosacral ligaments. In the upright position, these two ligaments are almost vertical. Laterally the peritoneum passes from the sides of the uterus to the side walls of the pelvis and forms the broad ligaments; a narrow strip of the uterus is left uncovered by it at each side. Between the two layers of the broad ligament are the Fallopian tube, ovary, epoophoron, paroophoron, round ligament, uterine and ovarian vessels, nerves and lymphatics.

(2) Anteriorly—Cervix is attached to the bladder by some loose connective tissue. Above the internal os the utero-vesical pouch lies between it and the bladder.

(3) Posteriorly—Pouch of Douglas containing coils of intestine.

(4) Laterally—Broad ligaments. The ureter is  $\frac{3}{4}$ " from the lateral fornix at the level of the internal os, and is there crossed by the uterine artery.

**BLOOD SUPPLY.**

Arteries—uterine and ovarian.

Veins—uterine veins form a plexus and drain into the internal iliac vein. Right ovarian vein drains into the inferior vena cava and the left into the left renal vein.

**LYMPHATICS.**

Upper part of body—lumbar glands. Some into the inguinal glands through the round ligaments.

Lower part of body and cervix—iliac glands.

**NERVES.**

(1) Sympathetic—Through the hypogastric. It is motor to the circular fibres and inhibitory to the longitudinal fibres.

(2) Parasympathetic—From the lumbrosacral autonomic through the Nervi erigentes. It is inhibitory to the circular fibres and motor to the longitudinal fibres.

Both the sympathetic and parasympathetic are controlled by the higher centres.

(3) Local—From the cervical ganglion.

Can produce independent rhythmical contractions.

**FALLOPIAN TUBES.**

Each is about  $4\frac{1}{4}$ " long; starts from the cornua of the uterus and ends in the peritoneal cavity near the ovary.

Four portions:—

(1) Interstitial—Half an inch long and traverses the uterine wall.

(2) Isthmus—narrow part succeeding.

(3) Ampulla—wide middle part.

(4) Infundibulum—open abdominal end.

Blood supply—Uterine and ovarian arteries and veins.

Lymphatics—Lumbar glands.

Structure—Covered by peritoneum of broad ligament. Two muscle layers—external longitudinal, internal circular; Mucous membrane corrugated in longitudinal folds. Epithelium columnar, ciliated.

**OVARY.**

It is almond shaped, somewhat flattened from side to side and about  $1\frac{1}{4}$ " long,  $\frac{3}{4}$ " wide and  $\frac{1}{4}$ " thick. It has two borders, anterior and posterior, two surfaces, inner and outer, and two poles, uterine and tubal. It is situated in the lateral pelvic wall, in a depression, known as the *ovarian fossa*. This fossa is bounded above by the external iliac vessels and posteriorly by the hypogastric artery and ureter. The anterior or mesovarian border is attached to the posterior layer of the broad ligament by a short mesentery through which the ovarian vessels and nerves enter.

Structure—Two parts, outer or cortex which forms the bulk of the ovary and inner or medulla.

CORTEX—Consists of,

- (i) GERMINAL EPITHELIUM, single layer of cuboidal epithelium entirely covering the ovary.
- (ii) STROMA—Constitutes the main mass of the organ and mostly consists of spindle shaped connective tissue cells. Just below the germinal epithelium it forms the *tunica albuginea*.

(iii) THE GRAAFIAN FOLLICLES.

An ovary at birth contains about 100,000 follicles chiefly primitive i.e., an ovum surrounded by a single layer of cells.

Structure of the fully developed follicle—an external fibro-vascular coat, the theca folliculi, formed by condensation of stroma; and an internal coat consisting of several layers of nucleated cells, the *membrana granulosa*. At one part of the mature follicle the cells of the *membrana granulosa* project into the cavity of the follicle, this is known as the *discus proligerus* and in it the ovum is embedded. The follicle contains a transparent fluid, *liquor folliculi* which supplies the hormone œstrin.

- (iv) CORPUS LUTEUM—After discharge of ovum, the ruptured follicle is filled with blood clot. The cells of *membrana granulosa* proliferate to form the lutein cells. The lutein cell layer is always thrown into folds; the blood clot does not distend the cavity, and the inner layer of the theca folliculi being contractile is thrown into folds. The cells are polygonal and contain a yellow pigment and therefore called *lutein cells*. They gradually encroach the lumen of the follicle and small tufts of blood vessels accompanied by fibrous tissue grow in, towards the centre of the follicle. The entire structure is called the corpus luteum. The lutein cells undergo degeneration in six to eight weeks if there is no pregnancy. In case of pregnancy it enlarges and persists till delivery and when mature measures  $\frac{1}{4}$ "—1".

FUNCTIONS OF THE CORPUS LUTEUM :—

- (1) Produces decidual changes and helps embedding of ovum.
- (2) Inhibits ovulation, because antagonistic to the action of folliculin.
- (3) Helps milk secretion.
- (4) Helps uterine involution.
- (5) Lack of its internal secretion is supposed to produce hyperemesis.
- (6) Degeneration causes menstruation.
- (7) If at term corpus luteum persists, post maturity occurs.
- (8) When it dies at full term, the follicular hormone activates or sensitises the uterus to the hormone of the posterior pituitary (oxytocin) and labour starts.



### CHAPTER III.

## OVULATION, FERTILISATION AND DEVELOPMENT.

### Ovum.

#### STRUCTURE.

Thick outer covering, *zona radiata*.

Mass of cytoplasm.

A large nucleus or germinal vesicle.

A small nucleolus or germinal spot.

#### MATURATION.

Two rapidly successive divisions produce one mature ovum and two polar bodies.

Polar bodies soon break up and disappear.

#### RUPTURE.

Stroma covering the follicle becomes more and more thinned until the ovum bulges on the surface of the ovary.

Tension inside the follicle increases owing to accumulation of liquor folliculi and the most prominent portion becomes non-vascular, undergoes necrosis and bursts. This may be helped by menstrual congestion which causes a sudden rise of pressure.

After rupture, the ovum is set free in the peritoneal cavity and is carried towards the tube by currents set up in the peritoneal cavity by movements of the cilia in the fimbriated extremity of the fallopian tube and gradually passes towards the uterus along the tube.

#### FERTILISATION.

Union of the spermatozoon and the ovum usually takes place in the fallopian tube.

The spermatozoon reaches the tube by,

1. A positive chemiotactic action of the tubal secretion.
2. By movements of the tail of the spermatozoon.

#### EARLY DEVELOPMENT.

After fertilisation segmentation starts and the ovum divides into a mass of cells.

Soon the cells become arranged into a peripheral layer the trophoblast, which takes no part in formation of the embryo

proper and an inner cell mass from which the embryo is developed.

The trophoblast has two layers, an outer or syncytium, consisting of a layer of protoplasm shredded with nuclei and an inner or the layer of Langhans in which the cell outlines are well defined.

## EMBEDDING OF THE OVUM.

### FORMATION OF DECIDUA.

After fertilisation, the endometrium forms the decidua.

Glands—Epithelial lining is swollen.

Deeper parts are dilated, superficial parts or mouths become narrow.

Thus a superficial or compact and a deeper or spongy layer are formed.

Surface epithelium of the uterus changes from columnar to cubical and then to flattened type.

Stroma cells are enlarged and the fibrillated connective tissue disappears.

So the fully formed decidua consists of large polygonal cells with round nuclei and devoid of connective tissue stroma.

IMPLANTATION—Trophoblast can erode the uterine mucosa, probably by the action of a digestive ferment and thus the ovum bores its way into the decidua. The hole through which the ovum penetrates, is filled by blood clot and is known as Reichert's cicatrix.

### DIFFERENT PARTS OF THE DECIDUA.

1. Decidua basalis—Portion which lies between the ovum and the uterine muscle. It is the only part of decidua which takes part in the formation of normal placenta.
2. Decidua capsularis.—Part covering the ovum.
3. Decidua vera.—Rest of the decidua covering the uterine cavity.

About the end of twelve weeks, (due to increase of the size of the ovum) decidua capsularis comes in contact with decidua vera and unites with it. The placenta is also formed by this time.

### FUNCTIONS OF DECIDUA.

1. Provides a bed for the implantation of ovum.
2. Prevents the trophoblast from eating into the uterine muscle.
3. Source of nutrition for the ovum in the early stages of development. Specially glycogen, fat, insulin, vitamins, folliculin.
4. Protects the mother from invasion by foetal cells.

**NUTRITION OF OVUM.**

**IN THE TUBE**—Tubal secretion, by a process of osmosis.

**FIRST FEW DAYS AFTER IMPLANTATION.**

- (a) Serum which exudes from the oedematous condition of the decidua.
- (b) Glycogen store in the decidua.
- (c) Products of digestion by the action of trophoblast on decidua.

**SECOND WEEK**—Blood in the intervillous spaces. Nutritive material passes by osmosis as the villi are devoid of any vessels at this stage.

**THIRD WEEK**—Omphalo-mesenteric vessels appear and whatever nutritive material there may be in the yolk sac, can be absorbed.

**FOURTH WEEK**—Vessels appear in the chorionic villi. Direct absorption of nutritive material from material to foetal blood.

**TWELFTH WEEK**—Placenta is formed.

## CHAPTER IV.

# DEVELOPMENT OF THE AMNION, CHORION AND PLACENTA.

## AMNION.

Amnion is a membranous sac which surrounds the embryo. It is developed from the ectoderm of the embryonic area. At first it is more or less flattened and closely applied to the embryo. The cavity soon enlarges out of proportion of the embryo and becomes distended with fluid. The enlargement obliterates the cavity of the blastocyst and the embryo is gradually carried into the amniotic cavity by elongation of the ventral stalk. Later, it comes in contact with the chorion and unites with it.

The enlargement of amnion is due to accumulation of fluid, known as the amniotic fluid or *liquor amnii* into the cavity. This enlargement brings the amnion in contact with the foetal surface of the placenta.

### Amniotic Fluid.

AMOUNT—10-40 oz. Maximum amount is present between the 28th and 32nd week, after which some of it is probably absorbed.

SPECIFIC GRAVITY—1010.

CONTAINS,

Inorganic salts 5 per cent., chiefly chlorides, sulphates and phosphates.

Albumin 1 per cent.

Urea, appears about the fifth week.

Solid matter, lanugo (hair from foetal skin).

Usually it is slightly turbid, due to presence of solid particles derived from foetal skin and amniotic epithelium.

SOURCE,

1. Secretion from amniotic epithelium.
2. Foetal urine.
3. Transudation from maternal vessels.

USES. •

1. Acts as a protective medium for the foetus, guarding against shocks and jars, and protecting it from the pressure of uterine contractions.

2. Provides the foetus room for free movement.
3. Source of fluid for the foetus as some of it is swallowed.
4. The fluid wedge is the best dilator of the cervix.
5. Flushes the birth canal from above downwards with aseptic fluid at the end of the first stage.
6. Being non-conductor of heat, maintains uniform temperature.
7. Prevents adhesion between the foetus and the membranes.

### CHORION.

The chorionic villi appear as small solid projections of trophoblast consisting of syncytium and layer of Langhans. Mesoderm then grows into the villi through the ventral stalk and spreads all round the blastocyst inside the trophoblast. The mesoderm is at first only cellular and forms the connective tissue core of the villi; later on blood vessels push their way into it. So the structure of the fully formed villus consists of,

1. Two layers of trophoblast (ectoderm).
2. Connective tissue core (mesoderm).
3. Blood vessels derived from the embryo.

By the end of the first month the whole of the blastocyst is covered with chorionic villi. Those opposite the decidua basalis, known as *chorion frondosum*, enlarge, and form the placenta, while the rest, called *chorion laeve*, takes no part in the formation of normal placenta.

Consists of foetal and maternal parts.

1. **FOETAL PART**—Formed by the villi of chorion frondosum, which branch repeatedly and increase enormously in size by budding of trophoblast and growth of mesoderm into them. Later on, blood vessels pass into them. The villi are bathed in maternal blood.
2. **MATERNAL PART**—Formation of blood sinuses.

Trophoblast comes in contact with capillary blood vessels; these are channels in the decidua with a mere endothelial lining and are easily eroded. The capillary vessel is thus opened up and a blood space is formed. The opened up vessel is surrounded by trophoblast, but always retains two openings for the blood to flow in and out. In this way a small blood island is formed. This process is going on all over the decidua basalis and sooner or later a small artery or vein is opened and the blood sinus becomes a big structure.

Villi are of two kinds,

- a. Those which pass deeply into the decidua, fastening villi.
- b. Shorter ones which hang loosely in the blood spaces.

## ATTACHMENT OF THE VILLI TO THE DECIDUA.

When a villus comes in contact with the decidua, the cells of the Langhans' layer proliferate and weld the villus into the decidua; the syncytium passes from the surface of the villus on to the decidua and thus the villus gains attachment to the uterine surface.

The placenta is fully developed by the end of 12th week.

The foetal blood in the villi is separated from the maternal blood by,

- (1) Trophoblast.
- (2) Thin layer of connective tissue.
- (3) Endothelium of the foetal vessels.

## PLACENTA.

**SHAPE AND SIZE**—Oval or discoid. Diameter 6"—8". Weight, one pound. Thickest at centre, thins out towards the edges. Usually attached near the fundus of the uterus.

**Surfaces**—Two,

- (1) **FOETAL**—Smooth and covered by amnion.  
Blood vessels are visible beneath it.
- (2) **MATERNAL**—Rough and spongy.  
Presents a number of rounded or polygonal areas, known as cotyledons. They correspond to groups of chorionic villi, separated from one another by fibrous septa derived from the uterine wall.  
Colour, dull red with a thin greyish layer on the surface.  
May have a gritty feel.

**SECTION ACROSS THE THICKNESS WILL PRESENT,**

1. Amnion.
2. Chorion.
3. Main trunks of chorionic villi.
4. Lateral branches of chorionic villi.
5. Maternal blood space.
6. Attachment of the main chorionic trunks to the decidua.
7. Lining of the maternal blood space.
8. Decidua basalis.

**FUNCTIONS OF THE PLACENTA.**

1. Respiration, exchange of gases.
2. Excretion.
3. Nutrition of the growing foetus.
4. Protects the foetus by preventing the passage of microbic and toxic substances.
5. Internal secretion, supposed to cause—
  - (i) Hyperplasia of the uterus (Frank).
  - (ii) Hyperplasia of the breasts (Frank).
6. Contain, thyroxin, folliculin, insulin, vitamins, glycogen.

**UMBILICAL CORD.**

Connects the foetus and the placenta.

**LENGTH**—Normally 20".

**THICKNESS**—That of the little finger.

Straight in the early stages, but develops a spiral twist from about the third month.

**KNOTS**—May be seen. They are of two kinds,

- (1) **TRUE**—Caused by the foetus passing through a loop. If drawn very tight, may kill the child from obstruction of circulation.
- (2) **FALSE**—Formed by localised dilatation of the umbilical vein or increase in thickness of Whartonian jelly.

**Constituents of the Cord.**

1. **EPITHELIUM**—Stratified epithelium derived from the foetal epidermis.
2. **WHARTON'S JELLY**—Myxomatous connective tissue. A special form of embryonic connective tissue.
3. **BLOOD VESSELS**—Two umbilical arteries and one umbilical vein.
  - (a) Two arteries derived from the internal iliac, carry the impure blood from foetus to the placenta.
  - (b) Two veins which fuse into one after the third month. It carries the oxygenated blood from placenta to the foetus.
4. **UMBILICAL VESICLE AND VITELLINE DUCT**—The remnants of the yolk sac.
5. **ALLANTOIS**—Sometimes occurs as a blind tube just reaching the cord. It is the remnant of the hypoblastic diverticulum, part of which forms the bladder.

**ATTACHMENT OF THE CORD.**

1. Normally to the centre of placenta.
2. Occasionally at the edge of placenta, *battledore placenta.*
3. Rarely to the amnion at a distance from the placenta and the vessels spread out from there to the placenta. This is known as velamentous insertion or *placenta velamentosa.*

## CHAPTER V.

### FOETUS.

#### LENGTH OF THE FOETUS.

Up to the fifth month—measurement is taken from vertex to coccyx.

After fifth month, length of the legs is included.

Length at a particular age may be obtained, in centimetres, by squaring the age in months for the first five months; and afterwards by multiplying the age in months by 5, *e.g.*, at three months,  $3 \times 3 = 9$  cm., at 6 months  $6 \times 5 = 30$  cm.

WEIGHT—Full term healthy baby, 5–10 pounds

#### CHARACTERISTICS OF THE FOETUS AT VARIOUS PERIODS :—

~~END OF FOURTH WEEK~~—Chorionic sac very large.

Amnion closely invests the embryo.

A large cavity exists between the amnion and chorion, the extra-embryonic coelome.

Olfactory pits, optic and auditory vesicles.

Limb buds are present.

~~END OF EIGHTH WEEK~~—Amnion in contact with chorion.

Umbilical cord formed and contains the primitive small intestine at its proximal end. Facial form completed. Ear and eyelids formed. Limbs show a jointed appearance. Tail has disappeared.

~~END OF TWELFTH WEEK~~—Decidua capsularis united with decidua vera. Placenta formed. Umbilical cord shows spiral twist. Primitive small intestine withdrawn into the body. Nails appear. Sexes can be differentiated from external organs. Weight 4 ozs.

~~END OF SIXTEENTH WEEK~~—Weight 7–8 ozs. and canal pervious.

~~END OF TWENTIETH WEEK~~—Weight 1 pound. Hair, lanugo, and vernix caseosa (a greasy substance composed of secretion of sebaceous glands and epidermal cells) cover the body. Latter prevents the skin of the foetus from maceration in the liquor amnii.

~~END OF TWENTY-FOURTH WEEK~~—Weight 2 pounds. Skin wrinkled. Eye brow and eye lashes appear. Pigment in hair.

~~END OF TWENTY-EIGHTH WEEK~~—Subcutaneous fat more developed, so the wrinkles disappear. Testicles appear in the



inguinal canal. Foetus viable but chances of survival very small. Weight 3 lbs.

**END OF THIRTY-SECOND WEEK**—Completely covered with vernix caseosa. Hair in scalp increases. Lanugo begins to disappear. Weight 4 lbs.

**END OF THIRTY-SIXTH WEEK**—Testes in scrotum. Weight 5 lbs.

**END OF FORTIETH WEEK**—Nails project beyond finger ends.

Whole of the intestine contains meconium. Only one epiphysis, the lower end of femur, has commenced to ossify.

### FOETAL CIRCULATION.

The umbilical vein carries pure blood from the placenta. It enters the body at the umbilicus and divides into two branches, one of which joins the portal vein to supply the liver, and the other *ductus venosus*, joins the inferior vena cava. The inferior vena cava receives blood from the liver through the hepatic vein, from the lower limbs and from the body wall below the diaphragm. From the inferior vena cava, blood enters the right auricle, and then being diverted by the Eustachian valve passes through the foramen ovale into the left auricle. From the left auricle the blood passes to the left ventricle and then goes by the aorta to be distributed to the head, neck and the spinal cord. From the head and neck blood is returned through the superior vena cava to the right auricle then to the right ventricle, from where it passes to the pulmonary artery and by the *ductus arteriosus* into the aorta distal to the branches for the head, neck and upper extremities. Passing down the thoracic and abdominal aorta, it supplies the body wall, intestines and lower limbs, but most of the venous blood is returned by the umbilical arteries to the placenta.

It is now generally believed that the two streams of blood coming into the right auricle by the superior and inferior venae cavae must mix to a certain extent.

### CHANGES IN THE FOETAL CIRCULATION AT BIRTH.

Inflation of the lungs diverts blood to them and the *ductus arteriosus* closes about the 7th or 8th day.

Umbilical arteries, umbilical vein and *ductus venosus* close between the 2nd and 5th days.

Foramen ovale closes about the 10th day. On rare occasions it never closes completely.

### FOETAL SKULL.

**BASE**—Incompressible.

**VAULT**—Compressible; the bones are united by membranous suture and this permits moulding or sliding of the bones over one another.

Consists of bones, sutures and fontanelles.

**BONES.**

1. Two halves of frontal bone.
2. Two parietals.
3. Squamous part of two temporals.
4. Squamous part of occipital.

**SUTURES.**

1. Sagittal—between the two parietals.
2. Frontal—between the two halves of frontal.
3. Coronal—between the frontal and two parietals.
4. Lambdoidal—between occipital and two parietals.
5. Two temporals—between squamous part of temporal and the parietal and frontal on either side.

**FONTANELLES**—Points where two or more sutures meet. Six in number; anterior, posterior, two anterolateral and two posterolateral.

- (a) Anterior—Largest, lozenge shaped. Situated at the junction of coronal and sagittal sutures. Closes about 18 months after birth.
- (b) Posterior—Triangular. Situated at the junction of sagittal and lambdoidal sutures. Cannot be felt as a space during labour. It closes soon after birth.
- (c) Antero-lateral or anterior temporal—Junction of temporal and coronal sutures.
- (d) Postero-lateral or posterior temporal—Where temporal suture meets the mastoid.

The anterior and posterior fontanelles form important diagnostic landmarks.

**DIAMETERS OF THE SKULL**—Shortest distance from one fixed point to another.

**A. ANTERO-POSTERIOR DIAMETERS** in Europeans and Anglo-Indians: *re.* Indians *vide* note below.

- (i) Suboccipito-bregmatic—From junction of the head and neck behind to the middle of the anterior fontanelle,  $3\frac{3}{4}$ ".

Engages in fully flexed vertex presentation.

- (ii) Suboccipito-frontal—From junction of head and neck behind to the prominence of the forehead, 4".

Engages in incompletely flexed vertex presentation.

Maximum diameter to distend the vulva in fully flexed vertex presentation.

- (iii) Submento-bregmatic—From junction of the head and neck in front to the middle of the anterior fontanelle,  $3\frac{1}{4}$ ".

Engages in fully extended face presentation.

- (iv) Submento-vertical—From junction of the chin and neck to the farthest point on the vertex,  $4\frac{1}{2}$ ".

Engages in face presentation with incomplete extension.

- (v) **Mento-vertical**—From chin to the farthest point on the vertex  $5\frac{1}{4}$ ".  
Engages in brow presentation.
- (vi) **Occipito-mental**—From the point of chin to the posterior fontanelle,  $4\frac{3}{4}$ ".  
Engages in complete extension of the after-coming head.
- (vii) **Occipito-frontal**—From the root of the nose to the posterior fontanelle,  $4\frac{1}{2}$ ".  
Engages in unreduced occipito-posterior position and incomplete flexion of the after-coming head.

#### B. TRANSVERSE DIAMETERS.

- (i) **Bi-parietal**—Between the two parietal eminences,  $3\frac{3}{4}$ ".
- (ii) **Bi-temporal**—Between the most distant parts of the coronal suture,  $3\frac{1}{2}$ ".
- (iii) **Bi-mastoid**—Between the two mastoid regions,  $2\frac{3}{4}$ ".
- (iv) **Superparieto-subparietal**—From above one parietal eminence to below the other,  $3\frac{3}{4}$ ".  
Engages in flat pelvis (Naegelé's obliquity).

#### CIRCUMFERENCE.

1. Suboccipito-bregmatic, about 11".
2. Cervico-bregmatic, 13".
3. Occipito-mental, 14".
4. Mento-vertical, 15".

#### REGIONS.

1. **VERTEX**—Between the anterior and posterior fontanelles in front and behind, and the parietal eminences on either side.
2. **FACE**—From the junction of the chin and neck to the glabella.
3. **BROW**—From root of the nose to the anterior fontanelle.
4. **OCCIPUT**—From the posterior fontanelle to the junction of the head and neck behind.

**Note**—The head of the foetus of the **Oriental races** has all the diameters approximately  $\frac{1}{2}$ " less than that of European races. This is in part explained by diet and early maturation and parturition of mother. Moreover the bones are softer, permitting a greater degree of moulding.

## CHAPTER VI.

### BACTERIOLOGY OF THE GENITAL TRACT.

The genital tract can be divided into three zones,

1. Septic—Comprising the part outside the hymen. It is full of pathogenic organisms like any other part of the skin, specially so due to its proximity to anus.
2. Aseptic—Comprising the vagina. The vaginal or lactic acid bacilli inhibit the growth of pyogenic organisms.
3. Sterile—Cervical and uterine cavities.

After labour there are only two zones,

1. Septic—Vulva and adjoining parts.
2. Sterile—Vaginal and uterine cavities.

This change is brought about by,

(a) Vagina being washed out by liquor amnii after rupture of the membranes.

(b) Placenta swabs out the canal during its expulsion.

Therefore a prophylactic vaginal douche is not only unnecessary but harmful as it carries the organisms from the septic to the sterile zone above, and may thus cause puerperal infection.

3. Within 24 hours of parturition, practically every type of pathogenic organism can be found in the vagina and cervix. But if postural drainage exists and there has been no gross injury to tissues, symptoms do not occur. For nature by virtue of its anti-infective vitamin A, stored in tissues and blood from an efficient food supply is able to resist infection. Frequently we have found the streptococcus pyogenes in the cervix without any symptom of disease; and in such cases it has been found in association with other organisms. If streptococcus is found in cases of puerperal sepsis, the severity of the illness is in proportion to the number of streptococci present; and we find the body of uterus is rapidly invaded from contiguous surfaces early in puerperium, the general severity of puerperal sepsis being proportionate to the trauma of child birth, whether natural or artificial.

## SECTION II—NORMAL PREGNANCY.

### CHAPTER I.

## PHYSIOLOGICAL CHANGES IN PREGNANCY.

### Uterus.

**INCREASE IN SIZE**—All the tissues hypertrophy.

Old muscle cells increase in size and new cells are developed.

Three distinct muscular layers; outer longitudinal, middle interlacing and inner circular.

Intramuscular connective tissue increased.

Increased vascularity.

At term—Thickness  $\frac{1}{2}$ "; length 12"—14"; diameter 9"; weight 2 lbs.

**FORMATION OF DECIDUA**—Thickest at about the 12th week, then gradually gets thinned.

Separates from the uterus through the spongy layer.

**BLOOD VESSELS**—Enlarged. Arteries pursue a cork screw course, and become obliterated when the uterus contracts.

Veins have no valves but there are acute bends, which are closed when the uterus contracts, and stops bleeding.

**NERVES**—Grow in size. Cervical ganglion is increased in size.

### CERVIX.

**SLIGHT HYPERTROPHY**—Some authorities maintain that it is lengthened.

**CHANGE IN POSITION**—Descends a little in the first three months and then it is gradually drawn upwards.

**CHANGE IN CONSISTENCE**—Softening begins in the lower uterine segment about the internal os and gradually spreads downwards. It is probably caused by increased vascularity and lymphatic dilatation. Secretion is increased.

**CHANGE IN COLOUR**—Violet colouration due to venous congestion.

**LOWER UTERINE SEGMENT**—Part of the uterus from the internal os to 3" above it. It corresponds to that part of the uterus which lies below the firm attachment of the peritoneum on the front of the uterus. It does not hypertrophy to a great extent and its main action during labour is passive dilatation.

### CHANGES IN THE RELATION OF UTERUS.

First two months slight increase of normal anteversion.

It inclines slightly to the right. Right lateral obliquity.

Broad ligaments are lifted up and pouch of Douglas becomes deeper.

Round ligaments hypertrophy and pain may be felt in the groin as they get stretched.

### Vagina.

**SOFTEN AND HYPERTROPHY**—Increased vascularity causes blue colouration.

**SECRETION**, increased, acid in reaction due to formation of lactic acid by vaginal bacilli. The secretion is bactericidal.

Violet colouration due to increased vascularity.

Varicose veins may appear. Causes,

1. Pressure of the pregnant uterus on the pelvic veins.
2. Back pressure caused by increased vascularity of the pelvic organs.
3. Inefficiency of valves.

### Breasts.

**INCREASE IN SIZE**, causes,

1. Congestion.
2. Actual overgrowth of the glandular tissue.
3. Increase of fat and fibrous tissue.

**COLOSTRUM**—Secretion of a clear fluid which can be squeezed out about the twelfth week.

More copious towards the end of pregnancy.

Consists of albumin, fat, water and large epithelial cells containing fat with an eccentric nucleus, called *colostrum corpuscles*.

Colostrum corpuscles disappear when milk secretion starts.

**NIPPLE**—Enlarges.

Primary areola—Raised, pigmented, and a number of swollen sebaceous glands known as *Montgomery's follicles* can be seen.

**SECONDARY AREOLA**—Pigmentation outside the margin of the primary areola. Appears about 20th-24th week.

### Skin.

(1) **PIGMENTATION** in certain places.

(a) Nipple and areola.

(b) In the middle line of the abdomen, particularly below the umbilicus, *linea nigra*.

(c) Broad band of pigment across the forehead, *cloasma uterinum*.

(2) **STRIÆ GRAVIDARUM**—Irregular scars produced by stretching of the skin of abdomen. At first they are pink but later on, may become pigmented, and finally assume a silvery appearance, *striæ albicans*.

### Alimentary system.

Morning sickness occurs in 50 per cent. Begins about the 6th week, and lasts for two months.

Dyspepsia, flatulence and constipation are common.

Appetite, generally good. Craving for unusual food may be present.

Hæmorrhoids—Common. Caused by pressure upon the rectal or pelvic veins.

### **Renal system.**

AMOUNT OF URINE INCREASED, causes,

- (1) Hydræmic condition of blood.
- (2) Increased blood pressure.
- (3) Increased blood supply to the kidneys.
- (4) Mother has to excrete for the foetus.

FREQUENCY OF MICTURITION, causes,

1. Early weeks of pregnancy—Uterus lies on the bladder.
2. Later in pregnancy—Excessive pressure on the bladder.
3. Urine may be irritating owing to hyperacidity and alteration in the urinary constituents.

Sugar may be present.

Nitrogen excretion seldom exceeds 1.5 per cent., specially in the later months of pregnancy.

4. An important symptom, demanding immediate diagnosis and treatment, of retroverted incarcerated gravid uterus.

**Nervous system**—Increased irritability.

### **Circulatory system.**

HEART—Apparent enlargement, as the diaphragm is raised. No true hypertrophy.

Palpitation is often complained of. Causes,

- (i) Gastric troubles.
- (ii) Increase in the average number of heart beat.
- (iii) Thoracic viscera being pushed up by the uterus.

BLOOD PRESSURE—May be slightly raised late in pregnancy owing to mild toxæmia.

### **BLOOD.**

Total amount increased.

Increase of leucocytes.

Diminution of red blood corpuscles.

Alkalinity diminished.

Increase of watery constituents causing œdema of the feet and ankles.

VARICOSE VEINS may appear in the legs.

### **General metabolism.**

General increase of all metabolic processes. Basal metabolic rate raised. Respiratory exchange increased. Oxygen intake and CO<sub>2</sub> output are both increased.

NITROGEN is retained and stored in the tissues.

UREA EXCRETION—Diminished.

Foetus requires glycogen. This may produce deficiency of glycogen in the maternal liver and may be a factor in causing morning sickness.

GLYCOSURIA of the alimentary type is more or less usual.  
Fat is deposited in the subcutaneous tissues.  
Phosphates, sulphates and calcium are stored.  
Excretion of chlorides is increased.

**Ductless glands.**

THYROID—Enlarged. Causes, increase of metabolism.

PITUITARY—Anterior lobe is hypertrophied.

Increased activity of the posterior lobe.

**CORPUS LUTEUM.**

Inhibits ovulation

Helps implantation of the ovum.

Stimulates uterine enlargement.

Inhibits hyperemesis gravidarum.

PARATHYROIDS—Probably hypertrophied.

SUPRARENAL—Enlargement of cortex.

Pigmentation of the skin may have some relation to the hypertrophy of this structure.



## CHAPTER II.

### DIAGNOSIS OF PREGNANCY.

To make a complete diagnosis of pregnancy, the following points must be ascertained.

1. Existence of pregnancy.
2. Age of pregnancy.
3. Expected date of labour.
4. Condition of foetus.
5. Number of foetuses present.
6. Presence of any complications.

Absolute diagnosis cannot be made before the 16th week, when some of the positive signs manifest themselves. The positive signs are :—

1. Foetal heart sounds.
2. Palpation of foetal parts.
3. Internal and external ballottement.
4. Foetal movements.
5. Skiagram of the foetal bones.
6. Funic souffle.

#### I. EXISTENCE OF PREGNANCY.

For the sake of convenience the various signs and symptoms may be divided into three periods.

- A. Early pregnancy—First twelve weeks.
- B. Mid pregnancy—Twelfth to twenty-eighth week.
- C. Late pregnancy—Twenty-eighth week to term.

#### A. Early pregnancy.

##### SYMPTOMS.

1. AMENORRHOEA—Usually the first symptom noticed by the patient. Menstruation may sometimes occur in the first twelve weeks from the potential surface of endometrium until the decidua vera and capsularis adhere. In the tropics due possibly to climatic pelvic congestion, this occurs in varying degrees in 23 per cent. of women. Bleeding may occur from the pregnant uterus but it is neither regular in its periodicity nor the quantity of blood lost is same as in regular menstruation. The developing corpus luteum inhibits ovulation, so any loss of blood is usually pathological, *i.e.*, double uterus, toxæmia, retroverted gravid uterus.
2. BREASTS—Sense of fullness. Slight enlargement about the fourth week.

3. **MORNING SICKNESS**—Begins about the fifth week and usually lasts for two months. Occurs in about 50 per cent. of women.  
Probable causes,
  - (i) Reflex irritation of stomach in neurotic women.
  - (ii) Mild toxæmia.
  - (iii) Deficiency of corpus luteum.
4. **FREQUENCY OF MICTURITION**, caused by,
  - (i) Increased anteversion of the uterus.
  - (ii) Retroverted gravid uterus.
  - (iii) Congestion of the pelvic organs.
  - (iv) Hyperacidity of urine.
  - (v) Increase in the quality of urine due to increased metabolism.
5. **OTHER SYMPTOMS**—Constipation, excessive salivation and craving for unusual articles of food.

## SIGNS.

1. **PIGMENTATION**—Areola, face and abdomen.
2. **BREASTS**—Tense, tender and feel shotty. Nipples more prominent. Montgomery's tubercles enlarged.
3. **VAGINA**—Violet colouration. Secretion increased.
4. **CERVIX**—Purple colouration. Softened.
5. **BODY OF THE UTERUS**.  
6th to 8th week, pyriform; size—goose egg.  
10th week, more globular; size—cricket ball.  
12th week, round; size—foetal head at term.
6. **HEGAR'S SIGN**—Is the varying consistence of the fundus, lower uterine segment and cervix of the pregnant uterus from the sixth to tenth week. It is caused by the softening of the lower uterine segment, while the upper part of the body is globular and firm, and the cervix is still firm and elastic.

Methods of eliciting the sign.

- (a) Place one or two fingers of right hand in the anterior fornix. Depress the abdominal wall with the fingers of the left hand behind the fundus and approximate the fingers of the two hands compressing the lower uterine segment between them.
- (b) When the uterus is retroverted—Place the fingers of the right hand in the posterior fornix; press with the left hand on the abdominal wall just above the symphysis pubis and try to approximate the fingers of the two hands.

First method is the best, as it elicits all the characteristics of Hegar's sign,

- (i) The upper part of the body is globular and elastic.

- (ii) The lower uterine segment is soft, and it feels as if the fingers of the two hands are almost in contact.
- (iii) The cervix itself is still unsoftened.
- 7. UTERINE ARTERIES—Can sometimes be felt pulsating at the lateral fornices.
- 8. ASCHEIM—ZONDEK TEST.

Principle—An anterior pituitary hormone is excreted in the urine of pregnant women. This urine, when injected subcutaneously in infantile female mice, causes the immature follicles to enlarge, hæmorrhage occurs into them, and finally atretic corpora lutea are formed.

#### TECHNIQUE.

Five infantile female mice about 7 grams in weight are taken. Six subcutaneous injections of unsterilised urine in each.

Three injections on the first day and three more on the second day. Single doses, 2 c.c. for mouse No. 1, .25 c.c. for No. 2, .3 c.c. for Nos. 3 and 4, and .4 c.c. for No. 5.

The mice are killed by coal gas 100 hours after the last injection and the ovaries exposed.

Normally the ovaries of infantile mice are about the size of pin's head and of a pale greyish pink colour.

After injection with pregnant urine, they become three times the normal size, red in colour and present yellowish projections corresponding to corpora lutea; or the projections may be of a cyanotic colour due to hæmorrhage in the follicles or corpora lutea may be seen.

Naked eye examination is sufficient for a positive diagnosis.

But, if necessary, ovaries may be examined microscopically.

Correct result in 98 per cent.

In case of hydatidiform mole, the urine gives a very strong positive reaction.

The reaction is positive only so long as there is living foetal tissue.

We have used this test successfully in doubtful cases of ectopic, fibroid plus pregnancy, rape and chorion epithelioma, sometimes using mice, sometimes rabbits.

#### B. Mid pregnancy.

##### SYMPTOMS.

1. AMENORRHŒA—Persists. Any bleeding at this period is pathological.
2. MORNING SICKNESS—Disappears about 16th week.
3. BREASTS—Prickly sensation. There may be aching pains.
4. QUICKENING—Mother feels the foetal movements. It feels like a sharp tap on the uterine wall from within, or a fluttering in the lower abdomen. About 17-18th week.
5. PAIN—May be felt in the groin due to congestion and stretching of the round ligaments.

Frequency of micturition usually passes off.

**SIGNS.****1. PIGMENTATION.**

More marked.

Appearance of secondary areola.

**2. BREASTS—Enlarged.** After the 6th week, secretion can be squeezed out.**3. ABDOMEN—Enlarged.**

(a) UTERUS—Reaches out of pelvis about the 13th week; after that it rises about an inch a fortnight.

(b) UTERINE CONTRACTIONS may be felt by placing the hand on the fundus (a very important sign, although it may sometimes be present in fibroid).

(c) UTERINE SOUFFLE—A blowing murmur heard by placing the stethoscope at the sides of the uterus. Produced in the uterine arteries. About 24th week.

(d) EXTERNAL BALLOTMENT—16th to 30th week.

Methods.

(i) Patient lying on one side. One hand is placed above and the other below the uterus on each side of the abdomen; the lower hand jerks the foetus upwards and recognises the impact as it falls back.

(ii) Patient in knee elbow position—foetus is pushed up with a jerk and then the hand feels the impact as it descends.

(iii) Patient on back. Uterus steadied by one hand on each side of the abdomen. If one hand is suddenly depressed it will come in contact with some foetal part.

(e) FOETAL HEART SOUND—Most important sign. 17/18th week. Best heard 2" above the symphysis pubis. Sounds like the ticking of a watch under a pillow. Rate about 140 per minute.

**4. VAGINA—Secretion increased.** Violet colouration and softening of cervix more marked.

INTERNAL BALLOTMENT—Foetus is pushed up through the anterior fornix and can be felt to fall back on the fingers with a tap.

External or internal ballotment can rarely be elicited after 30th week as there is very little liquor amnii to allow this.

**5. X-rays—About the 12th or 13th week foetal bones may be detected by using the Potter-Bucky diaphragm.****C. Late pregnancy.****SYMPTOMS.****I. THOSE DUE TO INCREASED PRESSURE,**

(i) Breathlessness.

(ii) Varicose veins in vulva and legs.

(iii) Haemorrhoids.

(iv) Frequency of micturition.

2. FŒTAL MOVEMENTS felt by mother.
3. LIGHTENING—Presenting part sinks in the pelvis and pressure on the diaphragm is relieved.
4. REFERRED PAIN—Shooting pain in the leg due to pressure on the trunks of the lumbosacral cord.

SIGNS—All signs of mid pregnancy persist.

ABDOMEN.

Striæ gravidarum.

Fœtal parts can be felt.

Uterine souffle can be heard.

Funic souffle—Soft blowing murmur synchronous with fœtal heart, caused by blood flowing through the cord.

### SIGNS AND SYMPTOMS PRESENT AT VARIOUS MONTHS OF PREGNANCY.

FIRST MONTH—Amenorrhœa, fullness of breast.

SECOND MONTH—Amenorrhœa, morning sickness, Hegar's sign, slight enlargement of uterus, pigmentation of nipple.

THIRD MONTH—Amenorrhœa, morning sickness, uterus at pelvic brim, softening and colouration of cervix, colouration of vagina, pigmentation of the areola, secretion may be squeezed from the breasts.

FOURTH MONTH.

Amenorrhœa. Uterus midway between umbilicus and symphysis pubis. Pigmentation of areola and appearance of Montgomery's follicles.

Quickening, uterine souffle, ballottement.

Softening of cervix.

Colouration of vagina.

FIFTH MONTH.

All those mentioned above.

Fœtal heart sound.

Uterus reaches umbilicus. Uterine contractions.

Secondary areola.

SIXTH MONTH.

All the above.

Uterus just above umbilicus.

Linea nigra.

Striæ gravidarum.

SEVENTH MONTH.

All the positive signs.

Uterus 3 fingers' breadth above umbilicus.

EIGHTH MONTH—Uterus almost to xiphoid cartilage.

NINTH MONTH—Uterus reaches the xiphoid cartilage.

TENTH MONTH—Uterus sinks to the position of eighth month.

**DIAGNOSIS OF FŒTAL DEATH.****In early pregnancy.**

Death is usually followed by expulsion of the ovum.

If not expelled, all the symptoms of pregnancy except amenorrhœa disappear; brown sanious discharge generally appears; when present it is diagnostic of fœtal death.

**Later.**

1. No fœtal movements are felt. Patient may give a history of tumultuous movement of fœtus and then cessation of all movements.
2. Decrease of the size of breasts.
3. Offensive uterine discharge.
4. Fœtal heart sounds are not audible.
5. Abdomen not increasing in size.
6. Size of uterus does not correspond to the age of pregnancy, and its consistency is harder than normal.
7. Feeling of malaise and evidence of toxæmia may be present.
8. In doubtful cases when there is no urgency, mark the upper level of the uterus with silver nitrate and examine after a month to note if there is any increase in the size of the uterus.
9. X'ray picture shows overlapping of cranial bones.

**DIFFERENTIAL DIAGNOSIS OF PREGNANCY.**

Definite diagnosis of pregnancy should not be made unless one of the positive signs are present.

**Differential diagnosis.****1. OVARIAN CYST.**

- (i) No positive signs of pregnancy.
- (ii) No morning sickness.
- (iii) No softening of cervix.
- (iv) No uterine souffle.
- (v) Fluctuation and thrill usually present.
- (vi) Amenorrhœa, very seldom.
- (vii) Breast change and pigmentation—Very rare.
- (viii) Bimanually, small unaltered uterus may be detected.

**2. UTERINE FIBROID.**

- (i) Menorrhagia.
- (ii) No vaginal colouration.
- (iii) No breast changes.
- (iv) No morning sickness.
- (v) No positive signs.

Uterine souffle and uterine contractions may be present.

**3. PREGNANCY ASSOCIATED WITH OVARIAN CYST OR UTERINE FIBROID—*Vide* p. 103, 104.**

4. **DISTENDED BLADDER**—Swelling disappears on passing a catheter.
5. **MENOPAUSE**—Sudden cessation of menstruation associated with deposit of fat in abdomen and intestinal distension may simulate pregnancy but no positive signs are present.
6. **PSUEDOCYESIS**—In this condition the patient is under the false impression that she is pregnant, and sometimes it is almost impossible to convince her that she is not pregnant. Amenorrhœa is usually associated with morning sickness due to dyspepsia and quickening forms a prominent symptom. Abdominal tumour may be present; this is caused by contraction of diaphragm but the patient does not realise it.
  - (i) The tumour disappears under anæsthesia.
  - (ii) No vaginal colouration.
  - (iii) No softening of cervix.
  - (iv) No positive signs of pregnancy.

#### **Duration of pregnancy.**

The average duration is 280 days, from the first day of last menstruation.

#### **Calculations of the date of delivery.**

1. From the date of last menstruation.
  - (a) Count forward nine calendar months from the first day of last menstruation and add 7 days.
  - (b) Count backward three calendar months from the first day of last menstruation and add 7 days.
2. From the date of quickening. Quickening is usually felt about the 17th week; add 23 weeks to this.
3. From the height of the uterus—The age of pregnancy can be determined from the height of the uterus above the symphysis and then the date of delivery can be ascertained by tape measure or callipers.

At 1 lunar month or 4 weeks the fundus is 2" above the symphysis.									
" 2	"	"	"	8	"	"	"	3"	"
" 3	"	"	"	12	"	"	"	4"	"
" 4	"	"	"	16	"	"	"	5"	"
" 5	"	"	"	20	"	"	"	6"	"
" 6	"	"	"	24	"	"	"	7"	"
" 7	"	"	"	28	"	"	"	8"	"
" 8	"	"	"	32	"	"	"	9"	"
" 9	"	"	"	36	"	"	"	10"	"
" 10	"	"	"	40	"	"	"	11"	"

## CHAPTER III.

### ANTENATAL CARE.

Most of the difficulties and disasters of labour can be prevented if recognised early enough. This renders antenatal supervision a very important part of preventive medicine. We strongly advise all women, especially multiparæ to take 5 grs. of quinine daily during the last 6 weeks. This not only lessens the chance of fever before and after childbirth but greatly enhances the contractibility of the uterus during labour and thereby lessens risks of tropical uterine inertia.

#### ADVANTAGES.

1. If everything is found normal, the patient is told so. It will relieve her anxiety.
2. There is ample time to deal with abnormalities if found.
3. Routine urine examination will detect impending toxæmia and proper treatment will prevent it.
4. Venereal disease can be diagnosed and treated and there will be good chance of getting an uninfected baby.
5. Any constitutional disease can be detected and properly treated.

#### ANTENATAL EXAMINATION.

1. General examination, including blood examination.
2. Obstetrical examination.
3. Urine examination.
4. Examination for vaginal discharge and venereal disease.

##### 1. GENERAL EXAMINATION.

History of any constitutional disease, *e.g.*, tuberculosis, nephritis, rickets etc.

Condition of heart, lungs etc. The blood pressure is very important.

Any deformity.

Presence of a septic focus *e.g.*, teeth.

##### 2. OBSTETRICAL EXAMINATION.

###### A. EARLY IN PREGNANCY.

(a) History of previous pregnancies, labour and puerperium, if there was any abnormality.

(b) Pelvic measurements or pelvimetry.

I. EXTERNAL.—The diameters are measured with an instrument known as pelvimeter.

###### • Diameters.

(i) Intercristal—Place the points of the pelvimeter on the outer margins of the iliac crests and take the widest diameter, 10"—11".



## NORMAL PREGNANCY

In Bengal and Burmese, 9"—10".

In Punjab and Anglo-Indians,  $9\frac{1}{4}"$ — $10\frac{1}{4}"$ .

- (ii) Anterior interspinous—Points of pelvimeter just outside the anterior superior iliac spines, 9"—10". One inch less than intercrystal. *Vide supra*.

- (iii) External conjugate—Taken with the patient standing. One point of the pelvimeter on front of pubis and the other on the 5th lumbar spine,  $7\frac{1}{2}"$ . In Bengal and Burmese, 7".

To find the fifth lumbar spine—half an inch above the centre of a line joining the posterior superior iliac spines, or three fingers below the centre of a line joining the highest points of the iliac crests.

Subtract  $3\frac{1}{4}"$  from the external conjugate and you obtain the true conjugate.

- (iv) Posterior interspinous—Between the posterior superior iliac spines,  $3\frac{1}{2}"$ —4" in Indians.

- (v) Transverse of the outlet—Between the inner edges of the ischial tuberosities, 4". Measurement is taken with the patient in lithotomy position and the line of measurement is immediately on front of the anus.

- (vi) Antero-posterior of the outlet—Between the lower edge of symphysis pubis and tip of coccyx, 5". Patient in lithotomy position.

- (vii) Diagonal conjugate—Distance between the sacral promontory and the under margin of symphysis pubis,  $4\frac{1}{2}"$ .

Method of taking the measurement—*Vide p. 115*.

- (viii) True conjugate—Distance between the promontory and upper margin of the symphysis pubis, 4"— $4\frac{1}{4}"$ . It is half an inch less than the diagonal conjugate.

II. INTERNAL PELVIMETRY—Skutsch's internal pelvimeter is sometimes used for the purpose. First of all the distance between the promontory and front of symphysis pubis is measured and then the thickness of symphysis pubis is ascertained and deducted from the former. This gives the true conjugate. This method is rarely used, as it requires too much internal manipulation, and administration of an anæsthetic. Moreover as the size of the child's head is still an unknown factor, accurate pelvic measurements are of very little use.

Important Diameters.

- (i) Antero-posterior of the inlet or true conjugate, 4"— $4\frac{1}{4}"$ .

- (ii) Transverse of the outlet, 4". Contraction of outlet is common in India. Sometimes it is very difficult to measure this diameter, specially in fat subjects. An approximate idea can be obtained by noting the width of the pubic arch.
  - (a) Press two fingers on each side of the urethra against the pubic arch. There should be enough space for two fingers in the recess.
  - (b) Press the 4 knuckles of first interphalangeal joints just behind the vagina between the ischial rami. There should be enough room for three or four knuckles.

**B. LATER IN PREGNANCY.**

- (i) Abdominal examination
- (ii) Vaginal examination.
- (iii) Determination of the relation between the foetal head and pelvic brim.  
 These will be fully described under obstetrical diagnosis, and contracted pelvis. *Vide* p. 115, 153.

- 3. URINE EXAMINATION—For sugar and albumen, once a fortnight in early pregnancy. Weekly examination in the last 4 weeks.
- 4. VENEREAL DISEASE.

In Eden hospital if any suspicion exists a Wassermann reaction is done as a routine in the antenatal department. Syphilis should be suspected when there is a history of miscarriage, premature birth or still birth, and confirmed by Wassermann reaction. If treatment is started four whole months before birth of the child, the baby is likely to be free from syphilis as the infection of the foetus does not occur before the 4th or 5th month *in utero*.

Gonorrhœa can be diagnosed by bacteriological examination of the discharge. Early treatment may cure the disease, if attendance at the clinic is regular but in every such case special care of the child's eyes should be taken.

**MATERNAL MORTALITY.**

**CAUSES.**

- 1. Puerperal sepsis.
- 2. Toxæmias of pregnancy.
- 3. Complications of labour,
  - (a) Shock.
  - (b) Hæmorrhage.
  - (c) Sepsis.

Except hæmorrhage, most of these conditions can be prevented by antenatal care and proper management of labour. Toxæmic type of accidental hæmorrhage can be prevented to a certain extent. Even in cases of hæmorrhage, prognosis depends on the promptness of treatment. Postpartum hæmorrhage can be prevented to a great extent by wise conduction of labour.

In Europe the average maternal mortality is about 0.4 per cent. and incidence of complication before, during or after labour is under 10 per cent.

In the tropics, the average maternal mortality is nearly 4 per cent. and the incidence of complication over 20 per cent. These high figures are due to lack of care, lack of diagnosis and lack of skilled treatment in a hot climate, where the incidence of tropical disease alone is high, and the general resistance to disease is low. For instance, the average hæmoglobin content of all European women is 80 per cent. and that of Indian women is 70 per cent.

## FCETAL MORTALITY.

### CAUSES.

#### 1. ANTENATAL.

- (a) Maternal diseases.
- (b) Placental abnormalities.
- (c) Developmental abnormalities.

The majority of deaths are caused by toxæmic conditions and syphilis of the mother, both of which can be prevented by proper antenatal care and treatment.

#### 2. INTRAPARTUM.

- (a) Toxæmia.
- (b) Antepartum hæmorrhage.
- (c) Complications of labour, usually by causing asphyxia.

Toxæmia and complications of labour can generally be avoided by antenatal care. Intracranial injury is a common cause of foetal death; this is usually produced by,

- (i) Application of forceps before moulding of the head is complete.
- (ii) Rapid delivery of after-coming head.
- (iii) Precipitate labour.

## CHAPTER IV.

### POSTNATAL CARE.

Sixty per cent. of Gynæcology is made up of lesions secondary to child-birth. It is therefore an obvious corollary that the degree of skill and care with which the process of delivery and the puerperium is conducted, is an important factor for a woman's subsequent well being.

In the tropics,

- (a) Muscles and ligaments take at least 10 weeks to resume their normal.
- (b) Raising the head of the bed 10" is essential.
- (c) Postnatal regular and regulated muscle exercises for the whole body are indicated.

#### SOME POSTNATAL SEQUELÆ.

- (1) Visceroptosis with its mental and physical disabilities; guarded against by—massage, abdominal exercises, laxatives, Curtis belt or Crepe Velpeau bandages.
- (2) Relaxed gaping vaginal outlet, due to stretching and non-involution of the Sphincter vaginae and Levator ani.  
Stacey-Wilson exercises performed by contracting the anus many times a day will improve matters. Operative measures may be needed later.
- (3) Pain in the hip or sacro-iliac joint on walking or rising due to relaxation of the joints; sometimes, pain over the pubes. A firm adhesive strapping bandage will relieve. Coccygo-dynia also occurs after precipitate or long labour at times.
- (4) Retroversion of the uterus with subinvolution, occurs in 30 per cent. cases and is responsible for backache, continuous blood discharge and malaise. Routine examination at the end of the 3rd week of the confinement with reposition of the uterus, and application of a ring pessary will cure many. In some, Hobbs' glycerine treatment may be necessary for a few days after or before replacement.
- (5) Laceration of the cervix followed by infection and erosion is present in 20 per cent. of cases after the first baby. Immediate treatment with 10 per cent. silver nitrate or electric cauterium will cure most. In others operative repair will be necessary. These laceration, and erosions are important. For they may predispose to one-child sterility and later cancer.
- (6) Prolapse or hernia of the pelvic viscera through the genital aperture is a very common complaint in the tropics,

due to stretching and subinvolution of the muscles and fasciæ of the pelvic diaphragm. In early days exercise, massage and a ring pessary may do good; later, operative repair of the cystocele, rectocele or procidentia will be necessary.

- (7) Infection of the cellular tissue, possibly of the parametrium, or of the uterosacral ligaments. This may cause low fever and pain; later cicatricial contractions of varying degrees around the uterus, urethra, ureter or rectum. Vaginal examination will detect it. Milk injections and diathermy will cure and relieve many.
- (8) One-child sterility is one of the most baneful results of lack of postnatal care. Apart from virulent puerperal sepsis, this condition may be caused by a low grade form of sepsis which has travelled upwards from the cervix eventually involving the tubes. Short of an abdominal operation, only a Rubin or lipiodol test can discover this; for it is the rule rather than the exception in this class of case to discover nothing palpable in the adnexa by vaginal examination.
- (9) Lastly quite apart from mental disorder, superlactation and superinvolution, it is by no means uncommon to meet with cases of endocrinal dysfunction where the patient has complete amenorrhœa, puts on weight, becomes apathetic and her skin is dry. These are cases of pituitary or thyroid hypo-function probably due to focal sepsis from the teeth, tonsils, cervix and uterus. They never become pregnant again.

## CHAPTER V.

### MANAGEMENT OF NORMAL PREGNANCY.

Advice should be given with a view to keep the patient healthy and comfortable during the period of pregnancy.

1. **DIET**—Rich indigestible foods and alcohol should be avoided. Adequate nourishment. Free carbohydrate food is of value as a protection against toxæmia. Plenty of water.
2. **DRESS**—Best suspended from the shoulder. It should not press on abdomen or breast. Abdominal belt, to support pendulous abdomen.
3. **EXERCISE**—Regular moderate exercise in the open air. Sudden jolts, riding, cycling should be avoided. Active exercise must be avoided by patients who are prone to abortion, specially during the time when periods would normally appear had the patient not been pregnant. Walking is the best exercise.
4. **BOWELS**—Constipation must be avoided, (it predisposes to toxæmia) preferably by diet, *e.g.*, fruits etc. Strong purges should not be given. Apocriants as phenolphthalein, cascara, liquorice powder, infusion of senna may be used.
5. **CARE OF BREASTS**—Washed daily with soap and water and carefully dried. If crusts form they should be soaked with olive oil and then removed with soap and water. If heavy and pendulous, supports may be used. The nipples should be gently drawn out daily.
6. **TEETH**—Teeth are more liable to decay during pregnancy. Should be cleaned after each meal and caries etc., properly treated.
7. **BATH**—Daily tepid bath.
8. **COITUS**—In early months there is risk of abortion. In later months, risk of sepsis. Therefore, not advisable except in mid pregnancy and then only in lateral position.
9. **EXAMINATION OF URINE**—Fortnightly for sugar and albumin. Weekly in the last month.
10. **NERVOUS SYSTEM**—Protected from worry and excitement. Hypnotics in case of sleeplessness.
11. **GENERAL INSTRUCTIONS**—Should report to the doctor at once in case of,
  - (i) Decrease of the amount of urine.

- (ii) Constant headache.
- (iii) Disturbance of vision.
- (iv) Œdema of face or ankles.
- (v) Bleeding.
- (vi) Constipation, nausea or vomiting, or abdominal pain.

12. The following diet is advised for Europeans with the idea of lessening the risks of vomiting and toxæmia of pregnancy with the addition of radiostoleum and Parrish's food for anæmias or diminished calcium content.

*Cereals.*—Oatmeal porridge or any of the breakfast foods, with milk. Brown or wholemeal bread, toast, rusks, cream cracker biscuits.

*Vegetables.*—Any vegetable in any form except fried.

*Fruits.*—Any fruit, either fresh or stewed.

*Meat.*—

Beef, lamb, mutton, veal, not at all; or only very occasionally. Pork never.

Curry never.

Chicken, (avoid duck, goose, or game).

Croquettes or rissoles, if not fried in deep fat

Eggs, liver, kidney, brains and bacon.

*Fish.*—Any fish, except mackerel and hilsa.

*Soups.*—Any soup, thick or clear, but free from fat.

*Sweets.*—Any jam or jelly, marmalade or honey, but pure honey is best of all. Milk puddings. Boiled puddings occasionally. No pastry, no cakes.

*Salads.*—Any salad, but sparingly of salad dressing.

*Fluids.*—Water, aerated water, home-made lemonade, orangeade, weak tea, coffee, milk, as desired.

No alcohol of any kind. Butter may be taken if desired, but not in large amounts. Cream, fat meats, and dry fish fried in deep fat should be avoided. Fruits and vegetables must be taken at least twice a day, and meat, if at all, not more than once every other day. Mild cheese, such as St. Ivel's is permissible.

13. For Indians we recommend the following diet with the addition of radiostoleum and Parrish's food.

*Cereals.*—Dhenki (home-pounded) rice—muri, khoi, chira etc.; atta (whole meal flour), and suji.

*Vegetables.*—

Sak (green leafy vegetables) in all forms except fried. Sabji (green fruits etc.) beans, pumpkins, cucumber, bringal, potal (parwal), green peas, squash, bhendi (ladies finger), cabbage, cauliflower, tomato, potato, cocoanut kernel and milk, onion, carrot etc., except when fried.

*Fruits.*—All, fresh or stewed.

*Eggs.*—Ducks or hens in any form except fried.

*Fish.*—Mud fish like—Kai, magur, singee. Fresh water fish—all except fatty ones (*e.g.*, hilsa, chetal, dhnai.).

*Meat.*—As in European diet.

*Fats.*—Oils, butter, ghee—sparingly. Dishes cooked in deep fat are better avoided (*e.g.*, pilau, loochi or puri, cheppati, rich curries etc.).

*Milk.*—Fresh goat's or cow's in any form—plain, dadhi, ghol; chhana permissible. Avoid buffalo's milk.

*Sweets.*—Honey, goor (molasses), jam, jelly, marmalade, chutney. No pastry, no cakes. Sweets prepared in butter or ghee should be avoided.

*Fluids.*—Water *ad lib*, serbet, cocoanut water, weak tea, coffee, aerated water, home-made lemonade or lime-juice.



## SECTION III—ABNORMAL PREGNANCY.

### CHAPTER I.

## PRESSURE SYMPTOMS OF PREGNANCY.

### 1. VARICOSE VEINS.

Usually appear in later months of pregnancy.

May involve the veins of vulva.

Caused by pressure of uterus on pelvic veins.

Treatment—Legs bandaged and kept slightly raised.

### 2. HÆMORRHOIDS—Caused by pressure of uterus on pelvic veins. They are more liable to inflammation and hæmorrhage during pregnancy.

Treatment.

Bowel—medicines should be taken so that bowels are opened before bed time.

Prolapsed ones—replaced.

Kept clean and swabbed with boric lotion.

If inflamed—Confined to bed and hot fomentations.

If bleeding—hamamelis or hazeline applications or injection treatment.

Operative treatment—contra-indicated during pregnancy.

### 3. ŒDEMA—Due to obstruction of lymphatic return. May also be caused by heart or kidney disease, eclampsia, toxic albuminuria, hydatidiform mole, pelvic tumour, too much salt in diet or deficient alkaline reserve in blood.

### 4. CRAMPS—Usually in the calf muscles, during the last few weeks of pregnancy. Caused by pressure on the lumbosacral plexus.

TREATMENT—In India the commonest cause is a calcium blood deficiency and shortage of vitamins A, B and D in food which may be corrected by suitable diet, sunlight, bath, and substances like cod liver oil and radiostoleum. Gentle massage with oil is temporarily useful. In Marwari and purdah-nashin women, very often the first early symptom of osteomalacia is muscular cramps or typical tetany.

### 5. FREQUENCY OF MICTURITION.

Cause,

Early in pregnancy—Body of the uterus falling on the bladder or pressing the cervix upon the urethra in a retroverted incarcerated gravid uterus. This is a grave symptom and the condition must be rectified at once.

Towards the end of pregnancy—Sinking of foetal head into pelvis.

## CHAPTER II.

### TOXÆMIAS OF PREGNANCY.

Under this heading a number of diseases are included, the causation of which is obscure but is now regarded to be due to a condition of toxæmia or autointoxication. They are,

1. Pre-eclampsic toxæmic albuminuria.
2. Eclampsia.
3. Vomiting of pregnancy (toxæmic).
4. Icterus gravis gravidarum.

**AUTO-INTOXICATION**—The toxins produced in the body by metabolic and digestive processes are normally eliminated by the kidneys or transformed into innocuous bodies by liver. During pregnancy an excessive amount of these toxins are produced and the mother has to excrete both for the child and the metabolic products derived from the growing uterus. If these cannot be eliminated rapidly enough, toxæmia results.

European primiparæ are particularly prone to suffer from toxæmia in the early months of pregnancy. Many cases of abortion being due to toxæmic early accidental hæmorrhage. Therefore special care is needed, *re.* diet, exercise, urine examination and blood pressure.

#### Causes of toxæmia.

#### THEORIES.

##### I. MATERNAL.

1. Bacterial infection.
2. Kidneys unable to excrete the toxins.
3. Liver deficiency—Inability to detoxicate the toxins.
4. Toxins originating from the maternal gut.
5. Incompatibility of maternal and foetal blood.
6. Endocrine deficiency. The following glands have been suggested by different authorities,—  
Thyroid,  
Pituitary,  
Adrenals.  
Corpus luteum.

##### II. FŒTAL.

1. Stumpf's theory—This has much support. Due to abnormal decomposition, an acetone like body is  
• formed, which damages the maternal kidneys during excretion.
2. Infarction and autolysis of the placenta produce the toxin.

3. Syncytial fragments may pass into maternal circulation and act as foreign protein, and thereby cause toxæmia.

#### NATURE OF THE TOXIN.

The toxins have not been identified but the lesions resemble those produced by snake venom; so it is likely that they may be intermediary products of protein digestion of the histamine group (Wright's H substances).

#### ÆTIOLOGY.

Most common about the age of 20.

More common in primigravidae than multiparæ. But elderly multiparæ are particularly liable.

Excess of nitrogenous food may predispose.

Pre-existing nephritis does not appear to predispose to eclampsia.

#### THE PREGNANCY KIDNEY OR PRE-ECLAMPTIC TOXÆMIA.

Occurs in 15 per cent. of primigravidae in Bengal. Not so common in multiparæ.

Commoner in cases of hydamnios, twins and hydatidiform mole.

Mechanical pressure on the ureters or increased intra-abdominal pressure due to enlarged uterus may hamper the action of the kidneys.

#### Symptoms.

Vary very much in severity.

Headache, usually frontal and often persistent, blood pressure raised.

Dimness of vision. Rarely, sudden blindness, but no evidence of albuminuric retinitis.

Œdema of the eye lids, hands and ankles; œdema of the vulva, back and lower abdomen may occur.

Vomiting is not common.

Epigastric pain may be present.

Urine—Quantity of albumen varies according to the degree of severity. Hyaline and granular casts may be present. Total nitrogen output diminished. Acetone frequently present.

#### Differential Diagnosis.

	Pregnancy toxæmia.	Chronic nephritis.
1. History . . . .	Nothing particular	History of scarlet fever, diphtheria, dysentery or previous attacks of œdema, may be present.

2. Number of pregnancy . . . . .	Primigravida	Usually Multipara.
3. Cardio-vascular changes . . . . .	Nil.	Thickened arteries. Raised blood pressure. Cardiac hypertrophy.
4. Albuminuric retinitis . . . . .	Practically never	May be present.
5. Retention of nitrogen . . . . .	Nil.	Common.
6. Tolerance of sodium bicarbonate (amount of the drug required to produce alkaline reaction of urine).	Increased	Not altered.
7. Diastase in urine	Very variable	Usually below 10.
8. Blood urea . . .	Usually below 50 mg. per 100 cc.	May be 70 or more.
9. Urea concentration test.	Usually above 1.5 per cent.	May be below 1.5 per cent.

**PROGNOSIS**—Depends on early diagnosis and treatment. Rarely fatal. If there is no improvement in one week with proper treatment eclampsia is liable to supervene.

The *Remote Prognosis* is of great importance.

In 40 per cent. the albuminuria does not return in subsequent pregnancies.

In 50 per cent. the albuminuria does return in subsequent pregnancies, jeopardising the life of the mother and foetus.

This fact shows that the first toxæmic pregnancy has caused an occult nephritis and demonstrates the fact that pregnancy is the most delicate test of renal function we possess.

In 10 per cent. the kidney is permanently injured by the first toxæmic pregnancy, and the patient drifts into a condition of chronic nephritis.

**Child**—Bad. Labour is often premature, and quite a number of the children are born dead. Holland in a series of 351 foetal deaths demonstrated that 77 i.e. 26 per cent. were caused by albuminuria, eclampsia or accidental hæmorrhage, and that the mother's future health was jeopardised in 50 per cent.

### **Treatment.**

Patient put to bed.

### **DIET.**

Severe cases—No food for 24 hours. Glucose per rectum and fruit juice and lactose by mouth. Exclude salt, give plenty of water.

Mild cases—Fish, junket, milk pudding. Exclude nitrogenous foods. Plenty of water *e.g.*, barley water, imperial drink. Rectal salines with glucose may be given.

If improving,

Second day—Fruits and glucose.

Third day—Carbohydrate diet.

Fourth day—Milk, pudding, eggs, tender meat etc.

**BOWELS**—Kept freely open by magnesium sulphate every morning.

**URINE**—Total amount must be measured everyday and the quantity of albumen estimated.

**BATH**—Hot bath everyday. It keeps the blood pressure down.

**BLOOD PRESSURE**—If over 180, veratrine may be given or venesection of 10–15 ounces of blood.

Patient must be watched for warning signs of eclampsia and if the condition does not improve, uterus must be evacuated.

#### INDICATIONS FOR INDUCTION OF LABOUR.

1. Symptoms increase in spite of treatment.
  - (a) Quantity of albumen in urine.
  - (b) Blood pressure.
  - (c) Headache.
2. Sudden onset of fresh symptoms, *e.g.*, headache, vomiting.
3. Jaundice, marked disturbance of vision, urgent vomiting, suppression of urine—Uterus must be evacuated at once.
4. Blood urea over 50 mg. per cent.
5. Urea concentration test—below 1.5 per cent.

#### METHODS OF EVACUATION OF UTERUS.

1. Bougies or stomach tube for mild cases.
2. Dilate with Hegar's dilators to full size and then do bipolar version, rupture the membrane and bring down a leg and leave to nature.
3. Vaginal hysterotomy or Cæsarean section—For urgent cases
4. Abdominal Cæsarean section—If any obstetric complication is present.

### ECLAMPSIA.

An acute toxæmia occurring in pregnant, parturient or puerperal women characterised by convulsions and certain changes in the liver, kidney etc.

**FREQUENCY**—1 in 200 in Bengal.

Comes on in the second half of pregnancy.

More common in primigravida, twin pregnancy and hydramnios. Most common during the rains and winter.

#### Clinical features.

Majority start with the symptoms of pregnancy kidney and develop eclampsia in a few days. Some cases occur with brief or no warning at all.

#### WARNING SIGNS OR PRE-ECLAMPTIC STAGE.

1. Frontal headache.

2. Puffiness of eyelids, disturbance of vision.
3. Epigastric pain or vomiting or severe nausea.
4. Œdema of vulva and legs.
5. Urine,

Quantity, diminished.

Albumen, present (usually appear a week before the onset of actual eclampsia).

Casts, blood; acetone bodies may be found.

6. Blood pressure—Raised.

7. Occasionally attacks of uræmic asthma, or œdema of lungs.

**ECLAMPTIC STAGE**—The fit closely resembles an epileptic fit except that there is no aura.

1. **PREMONITORY STAGE**—Begins in the face. Eyeballs are deviated and fixed. Twitchings of hand and face. Lasts from 15 to 20 seconds.
2. **TONIC**—Muscles in tonic spasm. Patient rigid, face cyanosed from spasm of the respiratory muscles. Lasts half a minute.
3. **CLONIC**—Convulsions appear. Face congested, breathing stertorous, and patient unconscious. May bite her tongue. Blood stained saliva may be beaten into froth by convulsive movements of jaw. Lasts, half to two minutes.

**COMA**—Convulsions are always followed by coma. After the first fit, it is of short duration, but gradually increases with successive fits, so that the patient may remain in a state of prolonged unconsciousness.

**TEMPERATURE.**

May rise to 103° or 104° F.

Probable causes, toxæmia and muscular exertion.

**PULSE**—Rate usually goes up.

**PULMONARY CONGESTION AND ŒDEMA** may develop.

They are serious complications.

**BLOOD PRESSURE**—Raised.

**URINE.**

Amount diminished, may be altogether suppressed.

Casts may appear.

Albumen, increased in amount; acetone present.

Total nitrogen in urine diminished

Ammonia coefficient—the ratio of ammonia nitrogen to other nitrogen in urine—usually raised (normally 3.5 per cent.).

After the attack, quantity is increased for 48 hours.

**CHILD**—Suffers from anoxæmia. Seldom dies in the pre-eclamptic stage, whereas in nephritis it usually dies in utero.

**Pathology.**

**LIVER.**

Sometimes enlarged but when degeneration has supervened, may be small.

Pale yellow colour.

Scattered red areas caused by hæmorrhage and yellowish patches due to fatty degeneration, may be found beneath the capsule.

*Microscopically*, Degeneration and thrombosis of the capillaries. Areas of extravasation of blood. Changes most marked at the *periphery* of the lobules.

**KIDNEY**—Enlarged, hard, subcapsular hæmorrhage may be present. Pale yellow in colour. Cortex thickened and pale. Pelvis of the kidney and right ureter may be dilated.

*Microscopically*—Capillary thrombosis and hæmorrhage.

Degeneration of the tubular epithelium. The epithelium of the tubules are seen in all stages of degeneration, most marked in the convoluted tubules.

Lumina of the tubules are filled with amorphous casts.

Interstitial connective tissue, oedematous.

#### URINE.

May be reduced or even suppressed.

Albumen always present after the first fit.

Urea, reduced.

Ammonia, increased. Acetone present.

Uric acid and other nitrogenous bodies, increased.

Bile, urobilin, occasionally present.

Casts, always present. Disappears within 4 days after last fit.

Red blood corpuscles, usually present.

**SPLEEN**—May show hæmorrhage.

#### HEART.

Necrosis and hæmorrhage may be found in the muscle.

Granular and fatty degeneration of the muscle.

**BRAIN**—Meninges congested. Subdural hæmorrhage may be present. Oedema of the brain; it may cause rise of intracranial pressure. Degeneration of nerve cells and fibres.

**LUNGS**—Oedema may be present.

#### BLOOD.

Fibrinogen diminished.

Nonprotein nitrogen increased.

Urea, increased.

Uric acid and creatinin increased.

**UTERUS**—No change. When associated with accidental hæmorrhage may show extensive infiltration of blood.

**PLACENTA**—Thrombosis, hæmorrhage, retroplacental clots and infarcts may be present.

#### Prognosis.

1. **COMA**—Taken as one symptom, the degree of coma has the most prognostic value. Different degrees of coma,
  - a. **DEEP**—From which the patient cannot be roused, mortality—63 per cent.
  - b. **COMA**—A needle prick produces some "response, mortality—20 per cent.
  - c. **DROWSINESS**—Patient can be made to speak, mortality 5 per cent.

## 2. NUMBER OF FITS.

Less than 7, good.

Between 7 and 13, bad.

Over 13, generally fatal.

## NUMBER OF FITS BEFORE TREATMENT IS STARTED,

Less than 5, good.

7 or more, bad.

Fits starting after labour—mortality is very high.

## 3. TEMPERATURE.

Above 103°, very bad. Hyperpyrexia, usually fatal.

Below 100°, good.

## 4. BLOOD PRESSURE.

Below 150 mm. good.

Above 150 mm. bad.

## 5. PULSE.

Over 120, very bad.

Below 100, good.

## 6. OEDEMA.

Is a good sign if limited. But general anasarca very bad.

Absence of oedema, bad.

## 7. ALBUMEN—Not of much prognostic value. If the urine becomes solid on boiling, bad.

CHILD—Mortality high.

**Complications.**

1. Bleeding, from injury of tongue.

2. May suffocate herself during a fit.

3. Septic broncho-pneumonia, from inhalation of septic saliva.

4. Mental derangement in 10—15 per cent. of cases.

5. Eye lesions generally do not persist, but occasionally may, caused by partial detachment of retina.

6. Jaundice, indicates serious hepatic involvement.

**Differential Diagnosis.**

## 1. EPILEPSY,

(i) History.

(ii) Cry.

(iii) Aura.

## 2. HYSTERIA,

(i) No albuminuria.

(ii) No coma.

(iii) No cyanosis.

(iv) No typical course, with tonic and clonic spasms.

(v) No incontinence.

(vi) Does not bite the tongue.

## 3. TUBERCULAR MENINGITIS,

(i) Acutely ill with fever.

(ii) Other signs of meningitis

(iii) Lumbar puncture.

## 4. NEPHRITIS WITH URÆMIC CONVULSIONS,

(i) History and signs of kidney disease.

(ii) Tendency to miscarriage in previous pregnancies.



- (iii) Increase of blood urea.
- (iv) Diastatic index below 10.

#### 5. TETANY,

- (i) Anæmia with or without evidence of osteomalacia.
- (ii) Dietetic caste errors.
- (iii) Spasm of larynx with cyanosis common.
- (iv) Carpopedal spasm.
- (v) Temporary unconsciousness without mental confusion afterwards.
- (vi) No albumen.
- (vii) Baby born healthy but liable to develop rickets (foetal) if not treated adequately.

### Treatment.

#### A. PROPHYLAXIS.

1. Examine urine every fortnight. Weekly examination in the last month.
2. Milk diet when albumen appears in urine.
3. Proper treatment of pregnancy kidney.

#### B. CURATIVE.

BEFORE FITS—Same as in pre-eclampsia.

TREATMENT OF THE FIT itself.

1. Don't move the patient during a fit
2. Put a gag of some sort between the jaws.
3. Turn the head to one side.
4. Loosen the clothing about neck, chest and abdomen.
5. Control fits according to the Rotunda or Strognoff's method.

#### The Rotunda Method.

1. Morphia gr.  $\frac{1}{4}$  at once.
2. Patient conscious—puly. jalap Co.  $1\frac{1}{2}$  dr., magnesium sulphate 6 dr. and plenty of water by mouth; bowel is washed out.
3. If unconscious—15 minutes after administration of morphia, stomach and colon are washed out until the return is clear.  $1\frac{1}{2}$  ounces of castor oil is left in the stomach, and one pint of water is left in the bowel after the lavage.
4. Cases of severe toxæmia—Inject 1 to 2 pints of sodium bicarbonate solution under the breast.
5. If further fits occur—Repeat morphia.
6. No improvement at the end of 10 hours—Inject another pint of sodium bicarbonate solution subcutaneously, and, if the bowels have not acted, wash it out again.

#### Strognoff's Method.

Remove all sources of irritation. Dark, quiet room. No unnecessary manipulation or examination.  
Morphia gr.  $\frac{1}{4}$  at once, hypodermically.

1 hour later, chloral hydrate 30 grains in 10 ounces of saline, rectally, if unconscious; by mouth, if conscious.

If the patient is conscious, 5 ounces of milk by mouth.

3 hours later, morphia  $\frac{1}{4}$  grain hypodermically.

7 " " chloral 30 grains as before.

13 " " chloral 20 grains " "

21 " " chloral 20 grains " "

Later, chloral 20 grains every 8 hours.

Hypodermic injections are given under chloroform. Whenever prodromal symptoms of fit appear, chloroform must be given. Rectum, if loaded, enema should be given but no gastric or colonic lavage.

If the blood pressure is above 140 mm. or the patient had more than 7 fits before treatment is commenced, venesection should be done and 15 ounces of blood drawn out. It should also be done if the patient had 3 fits after the treatment has been started and there is no chance of delivery in the next 4 hours.

In India with its limitations of good nursing, we have found that repeated hypodermic injection of 3 grains of sodii luminal is as good and even better than rectal injections of chloral hydrate together with 20 c.c. of a 10 per cent. solution of magnesium sulphate intravenously repeated if fits severe.

We have adopted for some years Stroganoff's method in preference to that of the Rotunda.

#### TREATMENT OF CASES IN LABOUR.

No interference unless there is some special indication. All manipulations must be done under chloroform.

Rupture the membranes when dilatation is nearly complete, or at once if case is severe.

Delay in second stage—Apply forceps.

Heart stimulant e.g., digitalis or camphor may be given if the pulse is over 110.

Oxygen inhalation for asphyxia after a fit.

Patient's position changed from right to left and *vice versa* to avoid hypostatic pneumonia.

#### DRUGS.

Veratrone  $\frac{1}{2}$  grain, if the blood pressure is above 160 mm.,  
1 grain, if above 200 mm.

Atropine for pulmonary oedema.

#### Sequelae and complications.

1. **RECURRENT TOXAEMIA**—A large number of patients suffer from toxæmia in subsequent pregnancies. This shows that the kidneys sustain some permanent damage which the patient can cope with in a non-pregnant condition but breaks down under the strain of pregnancy. *Vide* p. 42.
2. **MENTAL DISTURBANCE**—Usually clears up, some patients may become insane, usually of the maniacal type.
3. **INFECTION OF BLADDER** occurs in some cases but soon disappears.

4. UTERINE INFECTION is more liable because of œdema and lack of resistance to infection if any manipulation needed.
5. PULMONARY COMPLICATIONS—Liable to bronchitis and bronchopneumonia.
6. CARDIAC DILATATION—Usually recovers.
7. VISUAL DISTURBANCES—Usually normal vision is regained.
8. BEDSORES—particularly must be guarded against in the tropics.

### VOMITING OF PREGNANCY.

Vomiting is a more or less normal phenomenon in pregnancy. Morning sickness is present in 50 per cent. of pregnant women. It is usually limited to 2 or 3 times a day and occurs in the early part of pregnancy, 4th week to 4th month. When it interferes with nutrition, it is pathological. It must be remembered that vomiting may be due to some organic disease *e.g.*, gastric ulcer, cerebral tumour etc.

#### VOMITING OF PREGNANCY IS OF TWO TYPES,

1. Neurotic, which includes the "reflex" group of cases.
2. Toxic.

**Neurotic**—Great majority are of this type.

#### CAUSES—

Patient generally emotional or temperamental.

May have some domestic trouble or the pregnancy may not be wanted.

More frequent in women who suffer from spasmodic dysmenorrhœa.

#### SIGNS AND SYMPTOMS.

Starts as usual morning sickness but instead of subsiding it gradually increases, becomes more frequent until the patient is constantly sick and nothing is retained. There is hardly any loss of nutrition in the early stages, but later on wasting follows, mouth becomes dry, tongue coated and bowel constipated. Pain in epigastrium due to retching. Blood pressure falls and the patient becomes more ill and if not properly treated may terminate fatally. Relapses may occur.

#### CHANGES IN URINE.

Quantity reduced.

Usually no albumen.

Acetone, diacetic acid and beta-oxybutyric acid generally present.

#### Treatment.

1. Remove the patient from her environment or home.
2. **Assure** the patient that she will recover and the pregnancy will not be affected.
3. **DIFT.**  
Milk. If unable to retain anything, glucose and saline rectally, every 4 hours.

Second day, toast, steamed fish etc.

Third day, ordinary diet.

4. **DRUGS**—May help to convince the patient.

(i) Mixture containing bismuth carbonate and tinct. cardamom co.

(ii) In severe cases 1/10 gr. of cocaine by the mouth.

(iii) Endocrine extracts—Thyroid or corpus luteum may be useful, or 10—20 minims of adrenalin on the tongue.

(iv) Serum from a normal pregnant woman.

The good effect of any of the drugs may be due to psychological action.

**Reflex Vomiting.**

Displacements of the uterus, particularly retroversion, may cause vomiting, probably by a reflex action. The improvement after replacement may be due to suggestion. In any case, if retroversion is found, the uterus should be replaced.

**PROGNOSIS.**

Very good.

Relapse may occur specially if there is undue fatigue or worry.

**TOXÆMIC VOMITING.**

Usually comes on in the early weeks of pregnancy.

May start suddenly or in the same way as neurotic vomiting.

**SIGNS AND SYMPTOMS.**

**EARLY STAGE**—Sick after every meal; later vomiting independent of any food. Pain in epigastrium. Patient gets exhausted.

**LATER**—Frequency of vomiting increases, may come on throughout the day or even at night. Vomit is bile-stained. Mouth dry, tongue coated, bowels constipated, cheeks hollow, eyes sunken and mental confusion.

Urine, scanty, albumen may be present; acetone, diacetic acid and bile usually present.

The colour of vomited matter later changes to a brown or coffee ground colour and the patient presents a haggard appearance with or without jaundice.

Peripheral neuritis of arms and both legs is not an uncommon sequel in tropics.

Parotitis going on to suppuration, we have seen several times due to toxic condition and septic mouth in a hot dry climate.

**TERMINAL STAGE.**

Vomiting may cease or may contain blood, pulse 140 or over, temperature rises to 102° to 104°, urine may show albumen, bile and acetone bodies. Delirium, coma, and eventually death follows.

**LIVER.**

Yellow areas of fatty degeneration and patches of hæmorrhage. Necrosis of *central portion* of lobule, as in yellow atrophy.

Primary damage of the capillary endothelium may produce thrombosis of intralobular capillaries, cellular degeneration and necrosis.

In eclampsia, peripheral portion of the lobule is affected.

#### KIDNEY.

It is affected only in the later stages.

Degenerative changes in the cells of the convoluted tubules, showing cloudy swelling and the lumina may be filled with granular debris.

URINE—High coloured, quantity diminished. Albumen is present in severe cases, but its appearance may be delayed. Leucine, tyrosine crystals and bile may be present. Ammonia coefficient increases, may rise above 20 per cent. Acetone bodies present.

STOMACH—Normal.

SMALL INTESTINE—Hæmorrhages may be found.

#### Differential diagnosis.

Vomiting due to associated causes *e.g.*, gastric ulcer, cerebral tumour, must be excluded.

It is very difficult to differentiate toxic from neurotic vomiting in the early stages. Response to treatment is the only criterion to distinguish between the two. It is easy to differentiate in the later stages.

##### Neurotic vomiting.

##### Toxic vomiting.

- |   |   |
|---|---|
| 1. Easily responds to treatment.        | Not so.   |
| 2. Wasting and jaundice—Rare            | Common. Rapid emaciation.   |
| 3. Vomited matter—Never brown or red.   | May be brown or red in later stages.                                |
| 4. Fever, jaundice, rapid pulse—Absent. | May appear in the terminal stage.                                   |
| 5. Urine—Albumen—Nil.                   | Urine—Quantity, scanty. Albumen, present but may be late to appear. |

PROGNOSIS—Earlier the treatment is started, better the prognosis.

#### Treatment.

MILD CASES—Same as that of neurotic vomiting. 20 c.c. of a 25 per cent. solution of glucose can be given twice a day with 5 units of insulin.

#### SEVERE CASES.

Isolation, dark quiet room.

Mouth and teeth kept clean with some mouth wash.

Stop all food by mouth for 48 hours. Give plenty of water, in the form of lemon juice, iced sodium bicarbonate water etc., by sips.

Rectal saline, 9 oz. of saline with 1 oz. of glucose may be given every 4 hours.

In very severe cases, one pint of saline with 25 per cent. glucose should be given intravenously and repeated in 12 or 24 hours.

Simple enema every morning.

Examine urine for albumen and eyes for jaundice everyday.

At 8 P.M. veronal 20 grains in 1 oz. of olive oil per rectum, for about a week, or luminal if insomnia still persists.

Drugs. The following have been recommended.

50 c.c of serum from normal pregnant woman.

Corpus luteum 1 c.c. hypodermically or calcium intramuscularly.

5 units of insulin with glucose, intravenously.

Thyroid extract by mouth or hypodermically.

15-20 drops of 2 per cent. aqueous solution of iodine intravenously.

#### SIGNS OF GOOD PROGRESS.

1. Moist and clearing tongue.
2. Filling up of the hollows of cheek.
3. Good sleep.
4. Can retain some amount of food.

If progressing favourably—Give increasing quantities of simple food, orange juice, cocoanut milk, cream cracker biscuits and honey and cut down rectal saline. Gradually the carbohydrate food is increased. Fats are harmful, so do not give milk unless skimmed or whey.

#### INDICATIONS FOR INDUCTION OF ABORTION.

1. No improvement within 5 to 10 days.
2. Vomiting coffee ground material.
3. Pulse rate above 110.
4. Albuminuria—More than thin cloud on boiling.
5. Marked emaciation.
6. Jaundice.
7. Continued fever.
8. Mental disturbance.

#### METHODS.

If general condition admits waiting for 2-3 days—Laminaria tents are introduced and 24 hours later either the ovum is expelled or removed.

If urgent and imperative—Morphia gr.  $\frac{1}{4}$  with scopolamine gr.  $\frac{1}{200}$  hypodermically. Cervix dilated with Hegar's dilators and the ovum removed under open ether, nembutal or pernoctan anæsthesia. As there is great risk of hæmorrhage it is better to do vaginal hysterotomy in the first three months and abdominal hysterotomy in the later months of pregnancy. Intravenous saline with 20 per cent. glucose should be given during operation, as the patients are very liable to suffer from shock.

**ICTERUS GRAVIS GRAVIDARUM.**

It is a very serious condition. More common in the later months of pregnancy.

**Pathology.**

**LIVER**—Diminished in size, soft and more friable.

*Microscopically*, central portion of lobule, necrotic.

Cells in the periphery may not show any change.

Cells between the centre and periphery of the lobule, fatty degeneration.

Acute cases, whole lobule necrosed.

**KIDNEYS**—Evidence of degeneration and necrosis, specially the cells of the convoluted tubules.

**Clinically**—Two types.

1. **ACUTE**—Severe abdominal pain, intense headache, vomiting and diarrhoea. Soon becomes drowsy, delirious and then comatose. Severe jaundice. Rigors and high temperature usually.

**URINE**—Quantity, diminished. Albumen, casts, leucine, tyrosine crystals and frequently blood, are present.

2. **SUBACUTE**—Course not so rapid. Starts as pre-eclamptic toxæmia but soon jaundice appears and is followed by coma.

**Diagnosis.****1. JAUNDICE.**

It is very important to realise that because simple catarrhal jaundice is very common in the tropics due to chill of fans etc., many cases of incipient acute yellow atrophy of the liver with jaundice are missed and disregarded until the patient is in a precarious state.

In catarrhal jaundice, the stools are clay like, the liver is enlarged and tender, there is no albumen in the urine, the fever is slight and general malaise alone is the symptom whereas in acute yellow atrophy, although jaundice is an early feature, the patient is urgently ill from the outset.

**Gall-bladder disease in Pregnancy.**—Gallstones are peculiarly common in females in the tropics, and particularly so among the wealthier classes who take little exercise and incline to eat rich food. The calculi are largely composed of cholesterol which is obtained from that excreted in the bile. During pregnancy there is always hypercholesterolaemia, and this predisposes to the formation of gall-stones, and may be the reason why the specialist and general practitioner so frequently is confronted with cases of gall-bladder disease during pregnancy. It should be our aim therefore to keep the blood cholesterol of all fat and well-to-do pregnant patients who have had symptoms suggestive of cholelithiasis at the lowest possible level.

The cholesterol of the blood is dependent in a large measure upon the diet, hence one method of accomplishing this purpose should be to reduce the ingestion of cholesterol bearing food. Such foods as fat, egg yolk, fried food, sweetbreads, liver, kidney, pork, oily fish, (*hilsa*), butter and cheese, should be omitted from the diet.

Attacks of gall-stone colic are particularly common and frequent during pregnancy and easy to diagnose. One of us has on several occasions removed gall-stones and gall-bladder during pregnancy and miscarriage has not occurred.

2. DIMINUTION OF THE SIZE OF LIVER, DECREASE OF LIVER DULLNESS.
3. SIGNS AND SYMPTOMS OF PREGNANCY TOXÆMIA.

**Treatment**—Uterus should be emptied at once under spinal anæsthesia and the toxæmia treated with intravenous 30 per cent. glucose, alkalies etc.

#### MINOR TOXIC CONDITIONS.

1. PRURITUS.

- (i) Localised to vulva.
- (ii) Anywhere in the body.

#### TREATMENT.

Keep the part dry.  
Alkaline antiseptic vaginal douching.  
Nerve sedatives e.g., bromides.  
Skin bathed in carbolic lotion.

2. SALIVATION.

#### TREATMENT.

Astringent mouth wash, 1 dr. of alum to 1 oz. of water.  
Belladonna and thyroid extract, twice daily.  
Milk diet, if the above fails.



## CHAPTER III.

# HÆMORRHAGE IN EARLY PREGNANCY.

### Cause,

#### I. CONDITIONS DUE TO PREGNANCY,

1. Abortion.
2. Ectopic gestation.
3. Carneous mole.
4. Vesicular mole.

#### II. CONDITIONS ASSOCIATED WITH PREGNANCY,

1. Cervical polypus.
2. Carcinoma of the cervix.
3. Erosion of cervix.
4. Retroversion.
5. Double uterus.

## ABORTION.

**DEFINITION**—Expulsion of ovum before the twelfth week of pregnancy is called abortion and upto the 28th week is referred to as miscarriage.

**FREQUENCY**—1 in 5. More common in primigravidæ.

**Cause**—When the foetus dies, uterus treats it as a foreign body and expels it. The interval between the death of foetus and its expulsion is variable; usually it comes on about the time when menstruation would have appeared had the patient not been pregnant. Death of the foetus may be due to disease of mother or of the ovum itself. Abortion may also be brought about by stimulating the uterus to contractions by introduction of foreign bodies, administration of drugs or handling it too much during an operation.

#### A. CONDITIONS OF THE OVUM.

1. Any abnormality incompatible with life.
2. Multiple pregnancy.
3. Abnormal condition of placenta,
  - i. Extensive placental infarction.
  - ii. Premature separation.
  - iii. Placenta prævia.
  - iv. Extensive retroplacental hæmorrhage.
4. Abnormal condition of foetal appendages,
  - i. Vesicular mole.
  - ii. Hydramnios.
  - iii. Torsion or knot of umbilical cord.

## B. DISEASES OF THE MOTHER.

## 1. GENERAL.

- i. Syphilis.
- ii. Nephritis.
- iii. Acute specific fevers, specially influenza.
- iv. Toxæmias of pregnancy.
- v. Physical shock.
- vi. Mental shock.

## 2. LOCAL PELVIC CONDITIONS.

- i. Endometritis, by producing chorio-decidual hæmorrhage.
- ii. Retroversion.
- iii. Uterine tumours.
- iv. Local mechanical interference, e.g., adhesions, ventrofixation.
- v. Pelvic tumours.
- vi. Pelvic or uterine operations.
- vii. Certain drugs, abortifacients—e.g., quinine, ergot etc.

## C. PATERNAL—Syphilis.

COMMONEST CAUSES—Endometritis and retroversion in earlier months, syphilis and chronic nephritis in later months.

**Clinical varieties.**

1. THREATENED ABORTION—When the process of abortion begins, but its progress can be stopped before the death of the fœtus.
2. INEVITABLE ABORTION—When the progress cannot be stopped.
3. COMPLETE ABORTION—When all the products of conception have been expelled.
4. INCOMPLETE ABORTION.  
When some of the products of conception are still retained. Dangers, hæmorrhage and sepsis. Retained bits of placenta may form placental polyp later on.  
Infection—Three clinical types,
  - i. Localised in uterus—Produces septic intoxication.
  - ii. Infection may spread through blood and lymphatics producing pelvic abscess, salpingitis, metastatic abscesses, or into the peritoneal cavity causing peritonitis.
  - iii. Chronic endometritis.
5. MISSED ABORTION—Embryo dies, signs of abortion appear and then subside; ovum is not expelled.
6. CERVICAL ABORTION—Ovum is expelled from the upper part of the uterus but is retained in the dilated cervical canal below. There is continuous and intense pain but little or no hæmorrhage.

**Symptomatology.****THREATENED ABORTION.**

BLEEDING—Bright coloured, intermittent.

PAIN—Slight and irregular.

UTERUS—Soft, os not dilated.

**INEVITABLE ABORTION.**

BLEEDING—Persistent.

PAIN—Lower abdomen and back, gradually increasing.

UTERUS—Intermittent contractions, os may be dilated and membranes may be felt bulging.

**COMPLETE ABORTION.**

BLEEDING—Very slight. Lochia may continue.

PAIN—Intermittent.

UTERUS—Hard, os closed. Involution proceeds.

**INCOMPLETE ABORTION.**

BLEEDING—Amount varies. Persistent.

PAIN—Persists. Intermittent.

UTERUS—Soft, globular, os may admit a finger.

**Mechanism of abortion.**

**BEFORE TENTH WEEK**—Placenta is not yet formed. Ovum is separated from its loose attachment by chorio-decidual hæmorrhage and is expelled covered with the decidua capsularis.

**AFTER TENTH WEEK**—Placenta is formed about the twelfth week and so the ovum is firmly attached. The membranes rupture, foetus is expelled and is later followed by the placenta and membranes. The separation of placenta is more difficult and therefore it is more liable to be retained causing continued hæmorrhage; this is more marked after the twentieth week.

**Differential diagnosis.****i. ECTOPIC PREGNANCY.**

	Ectopic pregnancy.	Abortion.
1. Hæmorrhage . . . . .	Slight . . . . . Prune juice coloured.	More profuse. Bright coloured, may show clots.
2. Pain . . . . .	Severe. Varying degrees of shock.	Usually not so severe.
3. Signs of internal hæmorrhage.	Present . . . . .	Absent.
4. Vaginal examination.	Mass or fullness may be felt in the pouch of Douglas or tubal mole on vaginal examination.	Cervix soft. Os may be dilated.

- ii. VESICULAR MOLE, *Vide* p. 62.
- iii. CERVICAL POLYP, EROSION AND CARCINOMA—Vaginal examination (with speculum) will decide.
- iv. DOUBLE UTERUS—Very difficult to diagnose. The loss of blood will have menstrual characteristics.

### Treatment.

First of all decide whether threatened or inevitable abortion.

If impossible—Estimate the size of the uterus; if it corresponds to the period of amenorrhœa and hæmorrhage is not excessive, treat it as a case of threatened abortion.

If the os is dilated and it is obvious that some portion of the ovum has escaped or can be felt through the dilated os, treat it as a case of inevitable abortion.

Inspect the material expelled, if any, it may indicate complete or incomplete abortion.

If incomplete and there is free hæmorrhage, uterus should be evacuated.

### THREATENED ABORTION.

1. REST in bed, quiet room, friends prohibited, morphia gr.  $\frac{1}{4}$ .  
Patient should be kept in bed for a few days after the bleeding has stopped.
2. DIET—Light and small in quantity. No alcohol.
3. BOWELS—Small enema every morning if constipated.
4. DRUGS—Bromides and opium, three times a day, for at least a week. Tinct. opii—20 minims, tinct. belladonna—15 minims and ext. viburnum prunifolium 1 drachm, three times a day is also useful.

### INEVITABLE ABORTION.

#### INDICATIONS FOR INTERFERENCE.

1. Profuse hæmorrhage.
  2. Infection.
  3. Inability of the uterus to expel the contents.
1. HÆMORRHAGE.
    - (a) Plug the vagina and cervix with gauze soaked in sterile glycerine and give pituitrin hypodermically. Best, if there is no infection. No plug should be allowed to remain for more than 24 hours.
    - (b) Rapid dilatation of cervix with Hegar's dilators, (up to No. 12 or 14) and then a finger is introduced into the uterus and the ovum is detached, and removed with ovum forceps. If hæmorrhage still continues, uterus is plugged with gauze soaked in 1 in 1,000 flavine, violet green or glycerine.
    - (c) If the bleeding is not very profuse, dilatation may be started with tents and then completed with Hegar's dilators if necessary.

## 2. INFECTION.

Plug the cervix and vagina with gauze soaked in glycerine and give pituitrin hypodermically. Remove the gauze after 12 hours; the ovum usually comes out with it.

Failing this—Dilate with tent and remove the ovum with fingers. Inject 10 c.c. of glycerine into the uterine cavity 3 times a day through a No. 10 soft catheter which is sewn by one silkworm gut suture to cervix.

## 3. INABILITY OF THE UTERUS TO EXPEL THE CONTENTS—Manual removal after dilatation with tent.

## INCOMPLETE ABORTION.

Indications for interference and treatment—Same as in the case of inevitable abortion.

If hæmorrhage persists for more than a week in spite of treatment, rest and drugs, uterus should be curetted with a flushing curette and then catheter and glycerine treatment (as before) for a few days.

## PREVENTION OF REPEATED ABORTION.

The cause should first be determined and efficiently treated.

1. Syphilis—Both parents treated.
2. Endometritis—Curetting some weeks after last miscarriage. Husband and wife to undergo 3 months course of thyroid and iodine.
3. Retroversion—In pregnancy, manual reposition and pessary if necessary. Operative treatment in the interval of pregnancy if indicated by shortening the round ligament.
4. Deep cervical lacerations—Repaired.
5. Nephritis—Medical treatment. Pregnancy should be avoided.
6. Emotional and neurotic tendency—Protected from all sorts of excitement and depression.

**Habitual abortion**—Some women are very prone to abortion and no organic lesion can be found to account for it.

**TREATMENT**—Should be kept very quiet. Rest in bed, and a mixture containing tinct. opii and tinct. viburnum may be given when periods would have appeared had the patient not been pregnant; coitus should be avoided at these times. In some hypodermic injections of corpus luteum extract and full vitamin diet have been found useful. In others a 3 months' course of thyroid gr.  $\frac{1}{4}$  once a day and Lugol's solution 10 to 20 minims once a day in milk has proved successful.

## HÆMORRHAGIC PREGNANCY.

In some cases slight irregular loss of blood occurs all through pregnancy but nothing else can be found abnormal and the pregnancy ends in normal labour. These are probably cases of low implantation of the placenta.

**CARNEOUS MOLE:**

**Definition**—An ovum which has been killed early in pregnancy, usually before the formation of placenta, by slight progressive hæmorrhage or repeated small hæmorrhages.

**Pathology.**

The bleeding takes place into the decidua and chorio-decidual space. Blood is usually unequally distributed under the amnion producing irregular projections; this is known as *tuberous mole*. Sometimes the bleeding occurs inside the amnion and the foetus perishes—it is then called *blighted ovum*. In certain cases the ovum is retained for some time and it becomes fleshy by absorbing the fluids—the *fleshy mole*.

**Symptoms.**

Early signs of pregnancy.

Slight hæmorrhage.

Colour of the discharge changes from red to brown and may be offensive.

Uterus hard and larger than normal but smaller than the corresponding period of pregnancy.

No pain. Spontaneous evacuation is the usual rule.

**Differential diagnosis.**

1. FIBROID—Regular and profuse menstruation.
2. THREATENED ABORTION with living ovum—Symptoms of pregnancy progress.
3. VESICULAR MOLE—Vesicles in the discharge. Uterus larger than the period of pregnancy and of doughy consistency.

**Treatment**—No necessity to hurry. When the death of ovum is certain, dilate with Hegar's and evacuate with finger or ovum forceps or sponge holders.

**INDICATIONS FOR INTERFERENCE.**

1. Pain.
2. Hæmorrhage.
3. Infection.
4. Undue delay causing anxiety of the patient.

**METHOD**—Dilate with tent and then remove the ovum with finger or ovum forceps.

**Prognosis**—As a rule there is no bleeding or sepsis as the vascular and lymphatic channels are closed. Occasionally we have seen white leg occur due to spreading thrombo-phlebitis. Sterility frequently results due to chronic metritis and fibrous stricture of the tubes (more commonly at the internal ostia).

### VESICULAR OR HYDATIDIFORM MOLE.

It consists of a collection of vesicles caused by degeneration of the chorionic villi. Peculiarly frequent in India : 1 in every 230 confinements in the Eden Hospital.

#### Ætiology.

Nothing is definitely known as to its causation.

Usually occurs towards the end of sexual life.

It is an inherent disease of the ovum,

i. Only one ovum of twin pregnancy may be affected.

ii. Other pregnancies have been normal.

iii. Only a part of the placenta may be affected.

Other probable causes,

i. Endometritis.

ii. Endarteritis of foetal vessels.

iii. Hyperactivity of corpus luteum.

The villi are affected in the first three weeks of pregnancy before the development of placenta.

**Morbid anatomy.** Size of the uterus is larger than normal owing to proliferation of villi and concealed hæmorrhage into it. The vesicles vary in size. They may be very small or as big as 3 cm. in diameter. One vesicle is attached to the other and there is no common stalk. The embryo dies very early and disintegrates; occasionally only a part of the placenta may undergo hydatidiform degeneration, the foetus remaining alive. Chorionic vesicular degeneration is not infrequently seen in extra-uterine tubal pregnancy and may be a cause of early erosive rupture of an ectopic gestation.

In a large proportion of cases ~~polycystic~~ *lutein* tumours are easily palpable in both ovaries varying in size from a pea to tennis ball. These cysts accompanying hydatiform mole may be *post hoc* or *propter hoc*. Usually they gradually disappear after evacuation of the uterus, but may continue and require operation. In 30 per cent. of our cases of chorion epithelioma they have been present at the time of operation.

#### MICROSCOPICALLY,

1. Excessive proliferation of the chorionic elements, both syncytium and layer of Langhans.
2. Oedematous degeneration of connective tissue elements of the villi.

In some cases the villi penetrate through the decidua and perforate the uterine muscle—this is known as malignant mole, probably a precursor of chorion-epithelioma. Cystic condition of the ovaries is usually associated with vesicular mole formation. The cysts have very thin walls, contain watery fluid and lutein cells are found on microscopical examination; it reaches its maximum development in chorion-epithelioma. When the mole is expelled, ovaries gradually resume their normal size. Ascheim-Zonedk reaction is strongly positive in chorion-epithelioma.

**Clinical features.****SYMPTOMS.**

1. Bleeding. Blood may be mixed with fluid from the ruptured cysts giving a 'red currant juice' appearance to the discharge. Vesicles may be extruded.
2. Large size of the uterus may cause pain, nausea and vomiting.
3. Absence of foetal movements.
4. Œdema may appear.

**SIGNS.**

1. Uterus feels doughy and is larger than what it should be for the period of pregnancy.
2. No sign of foetus usually or in radiogram.
3. Usual signs of threatened abortion. No foetal heart sounds.
4. Vesicles may be felt on vaginal examination or found in the discharge.
5. Lutein cystomata palpable in lateral culs.

**Diagnosis.**—Main points for differential diagnosis.

1. Size of the uterus—Generally larger than is expected for the period of pregnancy.
2. No sign of foetus or in radiogram.
3. Presence of vesicles.

The following conditions need differentiation.

1. Threatened abortion.
2. Accidental hæmorrhage.
3. Placenta prævia.

**Complications and sequelae.**

1. Hæmorrhage—mortality 10 per cent.
2. Sepsis—mortality 15 per cent.
3. Perforation of uterus.
4. Chorion-epithelioma, occurs in 16 per cent., mortality—75 per cent. unless the earliest abdominal or vaginal hysterectomy is performed.

**Prognosis**—Earlier the treatment, better the prognosis.

**Treatment**—Empty the uterus as soon as possible.

**METHOD.**

If uterus is active, plug the vagina and inject 1 c.c. of pituitrin extract. As a rule the uterus empties itself in a few hours.

If there is no urgency,

Introduce tent; usually the mole is expelled spontaneously.

If not, dilate with Hegar's dilators next day; inject pituitrin and remove the mole gently with fingers. Remember that the uterus may be easily perforated. If bleeding continues, plug with antiseptic gauze.

If bleeding profusely and os not dilated,

Dilate with Hegar's dilators, inject pituitrin, and evacuate the uterus.



If the os is dilated—Inject pituitrin.

Try to squeeze out the mole by manual compression of the uterus. Hot intra-uterine douche will help.

After evacuation, uterus should be explored with finger and wiped out with gauze soaked glycerine and Hobbs' intra-uterine glycerine treatment adopted at once.

Ergot in puerperium. If red lochia continues for more than three weeks, uterus must be curetted and the scraping examined for chorion-epithelioma.

#### ALTERNATIVE TREATMENT.

Abdominal hysterotomy and complete removal of the mole.

##### ADVANTAGES.

1. Thorough removal of the mole.
2. More aseptic operation.
3. No risk of perforation of uterus.
4. Hæmorrhage can be better controlled.
5. An idea of the degree of malignancy can be gathered.

If the patient is over 40, the uterus should be removed with the mole *in situ*. If patient under 40 and naked eye evidence of gross villous erosion of muscle, this calls for hysterectomy.

#### ECTOPIC PREGNANCY.

**Definition**—Fertilised ovum developing outside the cavity of the normal uterus. Peculiarly common in tropics.

**VARIETIES**—(1) Ovarian. (2) Primary abdominal. (3) Tubal. (4) Interstitial or cornual, and (5) Pregnancy in a rudimentary uterine horn.

Of these, tubal pregnancy is most common and ovarian pregnancy is next, although the latter is very rare.

Commonest site—Ampullary part of the tube.

#### TUBAL PREGNANCY.

##### Causes.

1. Salpingitis, causing delay of the passage of the ovum due to,
  - (i) Loss of ciliated epithelium.
  - (ii) Loss of peristaltic activity.
  - (iii) Adhesions between the neighbouring folds of mucous membrane.
2. External wandering of ovum—Ovum makes a longer journey, generally from one ovary to the opposite tubal ostium and becomes too large to pass through the tube
3. Unusual length, kinking etc. of the tube.
4. Ovum may be held up in a *cul-de-sac*.
5. Spasm of the tubal isthmus.

**Course and Terminations.**

Pregnancy very seldom progresses beyond 9 weeks.

1. **TUBAL MOLE**—Ovum is killed by hæmorrhage and forms a mass of blood clot with the dead ovum in the centre.

2. **TUBAL ABORTION.**

Ovum extruded into the peritoneal cavity—Complete tubal abortion. When this occurs a decidual cast of the uterus is passed and bleeding from the tube ceases.

If the ovum is only partially detached, bleeding continues. This is known as incomplete tubal abortion and is distinguished by recurrent attacks of acute pain and faintness. These attacks may continue until a decidual cast is shed from the uterus signifying that the abortion is at length complete. But such delay is unwarranted and if operation is not performed may cost the patient her life.

Blood collects in the pouch of Douglas. In case of very slow bleeding, a hæmatocele may form round the tube—peritubal hæmatocele. If the abdominal ostium is closed, the tube is distended with blood and may rupture.

3. **TUBAL RUPTURE**—Caused by distension due to intra-tubal hæmorrhage or by erosion of the wall by the chorionic villi. Profuse hæmorrhage into the peritoneal cavity. Ovum may escape through the rupture into the peritoneal cavity.
4. **INTRALIGAMENTOUS RUPTURE**—When the rupture takes place between the folds of the broad ligament. The blood separates the fold of the broad ligament and forms a hæmatoma there. If the amnion remains intact pregnancy may continue.
5. **TUBAL EROSION WITH POSSIBLE PERSISTENCE OF PREGNANCY.**

At the end of the term, if the foetus is still alive mock labour comes on and then the foetus dies.

Fate of the dead foetus,

(1) May be absorbed.

(2) Suppuration, mummification, calcification or adipocere formation.

**Clinical features.**

1. **BEFORE RUPTURE OR ABORTION.**

Very difficult to diagnose.

Minor signs of pregnancy present.

Irregular hæmorrhage may occur.

Discharge of decidual membrane.

Vague colicky pains in the lower abdomen.

Uterus slightly enlarged.

A small mass may be felt on one side of uterus.

2. **TUBAL ABORTION.**

Intense pain in lower abdomen.

Faintness and signs of internal hæmorrhage with acute right or left shoulder pain in the supraspinous fossa.

Pallor due to shock and bleeding.

Pulse quick; temperature subnormal or slightly raised.

In cases of severe bleeding, signs of fluid in peritoneal cavity and pouch of Douglas.

In small hæmorrhage, slight tenderness in hypogastrium.

Slight vaginal bleeding and later a decidual cast of the uterus is shed.

Uterus, enlarged and soft, discharge may contain decidual cast.

Rigidity and tenderness of lower abdomen.

Only slight leucocytosis and rapidly diminishing red blood count.

### 3. TUBAL RUPTURE.

Intense pain in lower abdomen with tympanitic distention and free fluid in the flanks.

Signs of internal hæmorrhage.

Other signs as in the case of tubal abortion.

Recurrence of hæmorrhage is usually fatal.

### 4. SECONDARY ABDOMINAL PREGNANCY.

When the amnion remains intact after tubal rupture, pregnancy may continue.

Fœtal parts can be felt very distinctly and easily.

Usual signs of pregnancy continue, but uterus is not enlarged and does not contain the fœtus.

False labour at term with death of the child.

Fœtus may suppurate, become calcified, mummified or may form lithopædion. X'ray will make diagnosis clear.

**Diagnosis**—Typical cases are easy to diagnose.

### IMPORTANT POINTS FOR DIFFERENTIATION,

1. Minor signs and symptoms of pregnancy are present.
2. Unilateral mass may be felt through one of the fornices.
3. Slight vaginal bleeding with decidual cast.
4. Signs and symptoms of internal hæmorrhage.
5. Severe pain and shock.
6. If in doubt always put a Record needle into the pouch of Douglas. If blood comes into the syringe it can only be due to extra-uterine abortion or rupture or a rare condition caused by profuse hæmorrhage from the ovary (hæmatoma ovarii).

### DIFFERENTIAL DIAGNOSIS.

1. NORMAL PREGNANCY WITH SALPINGO-OOPHORITIS,  
Cervix soft and patulous.
2. ACUTE APPENDICITIS.
  - (i) Symptoms point to disease of the alimentary system.
  - (ii) Signs of inflammation.
  - (iii) No pallor or other signs of internal hæmorrhage.
  - (iv) No bleeding from vagina.
  - (v) Marked leucocytosis.

## 3. SWELLING IN THE POUCH OF DOUGLAS.

Pelvic hæmatocele and retroverted gravid uterus.

**Treatment.**

1. LIVING OVUM—Laparotomy and removal of the tube.
2. TUBAL MOLE—May be left alone, but the patient must be kept under strict observation and laparotomy must be done at once in case of hæmorrhage.
3. TUBAL RUPTURE OR ABORTION WITH SEVERE INTERNAL HÆMORRHAGE.  
Morphine hypodermically.  
Transfusion of blood or gum saline, and laparotomy as soon as the patient recovers a little.
4. BLOOD IN THE ABDOMINAL CAVITY BUT BLEEDING HAS STOPPED.  
Laparotomy and removal of the affected tube and blood clot.  
If infected—Drain through the pouch of Douglas.
5. DEAD FŒTUS more than two months old should be removed abdominally to avoid sepsis.
6. BROAD LIGAMENT HÆMATOMA—Better to remove abdominally.
7. ADVANCED ECTOPIC PREGNANCY.

(i) Operate immediately; fœtus removed and the main vessels supplying the placenta are ligatured. Placenta may be left in the abdomen to be absorbed but we always remove it if at all possible.

(ii) Others recommend immediate operation, marsupialization of the sac and plugging the sac with gauze.  
Disadvantages—Septic discharge and associated troubles.

(iii) In India we rarely see such a case until two or three weeks after mock labour when the placenta is thrombosed.

**Results—**

- (a) Gestation sac may rupture during the waiting period.
- (b) Sac may become infected after death of the fœtus.
- (c) Placenta may not completely be thrombosed at the end of three weeks.
- (iv) Drainage through the posterior fornix after removal of the fœtus, is useful. Because as a result of conditions present, there is a good deal of irritative peritonitis with exudation which collects in the pouch of Douglas. This exudate often becomes infected by *B. Coli* from the bowel and the patient

runs an unaccountable temperature. Later she passes frequent small motions with mucus and a P.V. examination shows that she has a collection of fluid in the pouch of Douglas which when evacuated smells abominably.

It is to prevent such sequelæ that we advise draining through the posterior fornix at the time of operation in all doubtful cases.

In the tropics it is frequently necessary to do a posterior colpotomy a few days after an early operation for ruptured tubal gestation or abortion due to an infected exudate giving rise to fever and irritative diarrhœa. Such cases always recover if diagnosed and treated early.

## DISPLACEMENTS OF THE PREGNANT UTERUS.

### RETROVERTED GRAVID UTERUS.

Retroversion is the commonest form of displacement of the pregnant uterus. A pregnant uterus may become retroverted or pregnancy may occur in an already retroverted uterus; of these the former is more common. Retroversion predisposes to sterility.

#### Terminations of retroverted gravid uterus.

1. **RESTITUTION**—Usually spontaneous reduction occurs if nothing prevents it. Or, the patient may report for slight hæmorrhage and then it is replaced by the doctor.

2. **ABORTION**—commonly occurs.

Causes,

1. Retroversion produces interference with venous return causing congestion and endometritis which ends in abortion.
  2. Excessive pressure on the uterus produces irritation of the muscle causing contraction of the uterus and abortion.
3. **INCARCERATION**—When the uterus continues to increase in size in the pelvis.

Causes—Anything interfering with the movement of the uterus.

1. Overhanging promontory.
2. Increased intra-abdominal pressure, abdominal tumour etc.
3. Peritoneal adhesions.

The symptoms are due to pressure on the pelvic contents, pain down the thigh, constipation, retention of urine. In exceptional cases the wall of the uterus may become gangrenous.

4. **SACCUATION OF THE ANTERIOR WALL OF UTERUS**—The anterior wall of the uterus increases in size to accommodate the growing foetus. Main part of the uterus is in normal position but behind the vagina and below the cervix there is a uterine pouch which fills up the pouch of Douglas. Cervix is high up and pushed forwards.

**Symptomatology**—Cases in which spontaneous reduction occurs, cause no symptoms. In some cases there may be frequency of micturition and back-ache which disappears when the uterus escapes from the sacral hollow and reaches its

normal position. In others there may be small bleeding during the early months of pregnancy simulating threatened abortion and causing abortion in many cases if the uterus is not properly replaced.

**IN INCARCERATION**, the first symptom complained of is retention of urine. Infection may follow and produce acute cystitis, which may travel up and cause pyelonephritis. In other cases the symptoms appear more gradually. Bladder never empties itself completely, so the amount of residual urine gradually increases and gets infected. Pus, blood and shreds of vesical mucous membrane may be present in the urine.

The cause of retention of urine is not definitely known.

It may be due to,

1. The lumen of the urethra being elongated and narrowed, becoming impervious with the slightest congestion or extra pressure on it.
2. Some interference with the neuro-muscular mechanism of micturition.
3. Pressure of the uterus on the veins of the bladder causes oedema of the neck of the bladder.

**BEFORE RETENTION** (during the first 3 months).

Back-ache. Brown or blood discharge.

Difficulty and frequency of micturition.

Sense of weight in perineum.

Vaginally,

Cervix high up, directed forwards.

A tense rounded swelling in the pouch of Douglas.

Bimanually—Body of the uterus absent from the normal position.

**AFTER RETENTION** (about the fourth month).

Bladder distended.

If infection—Signs and symptoms of cystitis.

Vaginally,

Vaginal walls tense and stretched.

Urethral orifice displaced upwards.

Cervix pushed high up and rather difficult to reach with the fingers.

External os directed forwards or forwards and upwards.

Bimanually—Body of the uterus absent from the normal position.

Rectal examination—Body of the uterus can be very easily felt.

**Diagnosis**—Retroversion should be suspected in case of any bladder trouble towards the end of the third month or in the fourth month of pregnancy. Bladder feels like a cystic swelling which disappears on passing a catheter. Vaginal examination will point to the exact position of the body of uterus and other features described above.

## DIFFERENTIAL DIAGNOSIS.

## 1. PELVIC HÆMATOCELE.

Points of resemblance.

- (i) Minor signs of pregnancy.
- (ii) Pelvic pain.
- (iii) Irregular loss of blood.
- (iv) Swelling in the pouch of Douglas.
- (v) Cervix pushed upwards.
- (vi) Mild fever.
- (vii) Frequency of micturition.

## DIFFERENTIATION.

	Retroverted uterus.	Hæmatocele.
(a) History of acute pain.	Nil.	Present.
(b) Vaginal examination.	Swelling, soft and elastic.	Swelling, boggy.
(c) Bimanual examination.	Body of uterus, absent from normal position. Cervix, tilted upwards and forwards.	Body of uterus, in normal position. Cervix, points downwards.
(d) Colour of blood discharged from the vagina.	Bright red as in threatened abortion.	Prune juice colour.
(e) In very urgent cases, pass a sound and it will indicate the position of the body of uterus.		
2. INTRAPELVIC OVARIAN CYST.		
Uterus pushed forwards and upwards.		
Abdominal swelling is not the distended bladder.		
Cervix looks downwards and backwards.		
Body of the uterus is in front.		
3. RETRO-UTERINE FIBROID AND PREGNANCY.		
Cervix pushed forwards and upwards but points downwards and backwards.		
Swelling in the pouch of Douglas is hard and rounded (but it may be softened due to pregnancy).		

## Treatment.

## 1. BEFORE RETENTION OF URINE—Treat the uterus.

Replace the uterus in the way described below.

Put a pessary in and confine the patient to bed for 2-3 days.

Pessary should be used up to the fifth month.

## 2. WHEN RETENTION HAS OCCURRED—Treat the bladder.

Empty the bladder gradually; rapid emptying may produce hæmorrhage into the bladder.

Put in a self-retaining catheter to drain; it is better than catheterising the bladder every few hours.

Urotropine 10 grains and acid sodium phosphate 15 grains, three times a day, by the mouth.

If cystitis is present—Wash the bladder out twice a day.

Keep the patient in bed.



This usually produces spontaneous reduction in 2-3 days.

Should it not happen, push the uterus up with a finger in the vagina. If necessary, auxiliary traction, with sponge forceps, applied to the anterior lip of cervix, with the patient in knee-elbow position, will help. In some cases a general anaesthetic may be necessary when Sims' position is used. A finger pushing the uterus up from the rectum helps greatly.

Failing above—Continuous pressure may be applied by a ball pessary inflated with air.

Complete failure is generally due to, overhanging promontory or pelvic adhesions, when laparotomy should be done and uterus replaced. If severe cystitis is present—Induce abortion; introduce tent for dilatation and inject glycerine by Hobbs' method between the membrane and uterus, 2 hours after tying catheter to cervix, *vide* p. 218.

### 3. ANTERIOR SACCULATION—Treatment in labour.

Push the pelvic pouch up, and pull the cervix down.

Deliver the child with forceps or traction by leg, after version, if necessary.

Failing above—Caesarean section.

### ANTEFLEXION AND ANTEVERSION.

May occur during the later months of pregnancy.

Causes,

(1) Pelvic contraction.

(2) Lax abdominal wall.

(3) Ventrofixation of the uterus.

Treatment—Abdominal belt to support the abdomen.

### PROLAPSE OF THE UTERUS.

Due to early rising after parturition, multiparity and lack of attention during and after labour, prolapse or hernia of the uterus occurs in over 60 per cent. of Indian women. Therefore pregnancy in a prolapsed uterus is not very unusual. As the pregnancy progresses, uterus is gradually drawn up into the abdomen. So a pessary is required only in the early months.

Danger—More liable to sepsis in puerperium and to abortion.

### HERNIA OF THE PREGNANT UTERUS.

Due to the lax, thin abdominal wall seen in the tropics, this condition is not uncommon. We have seen it due to diastasis of the Recti in multiparae and secondary to operative scars.

During labour the abdominal muscles do not help and the pendulous uterus through the scar tends to malposition, prolapse of cord or tedious labour. On several occasions we have done a Caesarean section, ligated the tubes and then performed a set operation to repair the hernia in the abdominal wall.

## CHAPTER V.

# ABNORMALITIES OF THE PLACENTA AND MEMBRANES.

### DISEASES OF CHORION.

1. Hydatidiform mole.
2. Chorion epithelioma.
3. Diffuse myxoma of the chorion—The connective tissue layer undergoes myxomatous degeneration and becomes converted into a jelly like substance.
4. Myxoma fibrosum of the chorion.

### DISEASES OF AMNION.

1. Hydramnios.
2. Oligoamnios.
3. Amniotic adhesions—Between the amnion and surface of foetus.
4. Inflammation of the amnion—Usually due to gonorrhœa, attempts at criminal abortion or extension of intrapartum infection.
5. Cysts of the amnion—Usually result from fusion of amniotic folds.
6. Amniotic caruncles—Rounded or oval opaque elevations on the foetal surface of placenta or on the amnion itself.

### HYDRAMNIOS.

Presence of an excessive amount of amniotic fluid, so as to produce symptoms or malpresentation (normal quantity, 1—2 pints). The fluid presents the same characters as normal amniotic fluid; sometimes it may contain slightly increased amount of urea.

#### **Ætiology.**

The fluid in normal cases is probably derived both from the mother and foetus.

More common in multiparæ.

Fifty per cent of the cases are associated with foetal abnormality.

46 per cent. occur with twins, most of which are uniovular.

#### **EVIDENCE OF MATERNAL ORIGIN.**

1. Maternal diseases specially cardiac and renal disease, lead to œdema of the placenta and increased secretion.
2. If sodium sulpho-indigotate is injected intravenously in a pregnant rabbit, it causes blue colouration of the amniotic fluid but the foetal kidneys are not affected.

3. Diabetes and syphilis of the mother are often associated with this condition.

#### EVIDENCE OF FŒTAL ORIGIN.

1. Only one amniotic sac of uniovular twins may be affected
2. Fœtal abnormalities *e.g.*, anencephalus, spina bifida, are often associated; it may be due to increased urinary secretion from stimulation of spinal or cerebral centres.
3. Lesions which cause obstruction of circulation either in the cord or in the body of the fœtus *e.g.*, persistence of vasa propria, cardiac abnormalities, stenosis or thrombosis of umbilical vein or cirrhosis of liver are frequently associated.
4. Excessive urinary secretion on the part of the fœtus. This may be caused by anencephaly, cardiac hypertrophy or renal disease of the mother. The latter may cause hyperactivity of the fœtal kidneys.
5. Fœtal skin—Thickened and folded condition of the skin are sometimes associated.
6. Inflammatory changes of the amnion may be seen in some cases.

#### Clinically—Two varieties, acute and chronic.

##### 1. ACUTE.

Rare.

Fluid accumulates very rapidly and causes great distress, severe pain, breathlessness, orthopnoea.

Pulse quick, temperature may be raised.

Abdomen tense and drum like.

It may not be possible to identify the fœtal parts. Ballottement may be obtained, but the parts may be too tender.

##### 2. CHRONIC.

More common.

Fluid accumulates slowly and usually there are no bad effects.

Abdomen distended, skin shiny, tense. Thrill, and ballottement can be easily obtained.

Uterus larger than normal and the fundus is at a higher level than is expected for the period of pregnancy.

Slight dyspnoea, varicose veins and hæmorrhoids may appear.

Fœtal heart sounds are difficult to hear.

#### Differential diagnosis.

##### 1. MULTIPLE PREGNANCY.

No fluid thrill.

Ballottement is not usually easy to obtain.

Multiple fœtal parts may be identified.

Two fœtal heart sounds may be heard.

X-rays will show two fœtuses.

## 2. OVARIAN CYST.

No ballottement.

No uterine souffle.

No positive signs of pregnancy.

Bimanually—Uterus not enlarged.

Pregnancy with ovarian cyst.

Two tumours may be identified.

One tumour; shows uterine contractions.

## 3. HYDATIDIFORM MOLE.

No thrill, uterus is hard and painful.

No ballottement.

Generally no signs of foetal life.

Vesicles with vaginal discharge.

## 4. ASCITES—No foetal parts or sign of foetus.

**Prognosis**—Effects of hydramnios on,

## 1. PREGNANCY.

(i) Toxæmia, albuminuria.

(ii) Miscarriage or premature labour.

(iii) Heart troubles.

## 2. LABOUR.

(i) Premature rupture of membranes.

(ii) Malpresentation.

(iii) Premature labour.

(iv) Prolapsed cord.

(v) Prolonged labour from uterine inertia.

(vi) Postpartum hæmorrhage, due to atony of the muscle.

## 3. PUERPERIUM.

(i) Afterpains.

(ii) Subinvolution.

**Treatment.**

In syphilitic cases antisyphilitic treatment may be useful.

**ACUTE**—Rupture the membranes and let the fluid escape slowly.

**CHRONIC.**

Rest.

If embarrassment—Rupture the membranes.

In labour—Puncture the membranes in case of uterine inertia.

In severe cases, one of us has performed exploratory abdominal uterine paracentesis on two or more occasions with no ill effect.

**OLIGO-AMNIOS.**

Absence or insufficiency of amniotic fluid.

Very rare.

**CAUSE**—Not known. Sometimes associated with the same conditions which produce hydramnios.

**RESULTS.**

Adhesions between foetus and amnion.

Intra-uterine amputation of foetal limbs.

Malformations of the foetus are common.

Foetus may be unduly compressed during labour.

**ABNORMALITIES OF THE PLACENTA.**

Labour may be tedious, specially the first stage.

**SIZE AND WEIGHT**—The size may vary. Weight is increased in syphilis and albuminuria of the mother and in foetal anasarca.

**SHAPE**—May be ovoid, reniform or lobulated.

Placenta bipartita, tripartita or multilobulata—When composed of two, three or more lobes, but the division is incomplete.

Placenta duplex, triplex, or multiple—When composed of two three or more separate lobes.

**PLACENTA SUCCENTURIATA**—When one or more accessory lobules of placenta are situated at a distance from the edge of the main placental mass.

Dangers—May be retained in the uterus and cause,

(1) Postpartum hæmorrhage.

(2) Infection.

(3) Severe after-pains.

So every placenta after expulsion must be examined to detect if any such mass is left behind. This can be determined by noting,

(i) Gap in the chorion.

(ii) Extension of vessels beyond the edge of the placenta and their abrupt ending at the margin of the gap.

**CAUSES OF LOBULATION.**

1. Abnormality of the decidua; chorionic villi growing more profusely in the more vascular area.

2. Villi at one part of the placenta may atrophy and so the placenta appears to consist of separate masses.

3. Infarcted areas in the placental mass. But as there is no abnormality in the membranes between the lobes this view is not tenable.

**PLACENTA FENESTRATA**—There is an aperture in the placental mass about the centre.

**PLACENTA DIFFUSA OR MEMBRANACEA**—The placenta covers the whole ovum and is not limited to decidua basalis.

Dangers,

(i) Premature labour.

(ii) Antepartum hæmorrhage.

(iii) Owing to adhesions, the placenta does not separate readily.

(iv) Postpartum hæmorrhage.

(v) Sepsis.

**PLACENTA CIRCUMVALLATA**—There is a central depression surrounded by a raised margin on the foetal surface due to proliferation of the villi at the margin of the placenta after the amnion has become attached to it.

**Abnormalities of insertion of cord.**

1. Battledore placenta—Cord inserted near the margin of the placenta.
2. Placenta Velamentosa—Cord is attached to the membranes at some distance from the placenta. The vessels spread out and pass to the placenta from there.  
 Danger—If the vessels cross the internal os, they may be torn when the membranes rupture and cause foetal death.

**Cysts of the placenta.**

1. SURFACE PLACENTAL CYSTS—Common.  
 Size—Varies from that of a cherry to hen's egg.  
 Derived from the chorion.  
 Contains clear fluid formed by degeneration of trophoblast.
2. DEEP CYSTS—Rare.  
 Smaller than former.  
 Contents usually clear but may be caseous.  
 Caused by breaking down of an infarct (pseudocyst) or degeneration of trophoblast.

**Infarction of placenta.**

Commonest abnormality of placenta

Two varieties, red and white.

**RED**—Pyramidal red area with its base towards the maternal surface.

Formation of red infarcts—Caused by localised death of placenta. Placenta itself is nourished by maternal blood. So in case of retro-placental hæmorrhage or hæmatoma, part of the placenta dies and forms a red infarct.

Usually associated with toxic albuminuria and nephritis.

*Microscopically.*

Congestion of the villous capillaries.

Intervillous spaces reduced.

**WHITE.**

The red infarct becomes avascular and decolourised, and forms the white infarct.

May be single and of small size or may affect one or more cotyledons.

May form a broad whitish ring encircling the placenta, when it is called *placenta marginata*.

**Syphilis of the Placenta.**

The following changes are usually found, but the placenta may not show any abnormality at all.

1. Weight-increased, ratio to the weight of foetus, 1 : 3. (normally 1 : 6); œdematous and friable.

2. Colour paler than normal owing to diminished vascularity produced by occlusion of the vessels.
  3. Villi.
    - Enlarged (due to increase of stroma cells).
    - Thickened.
    - Intervillous spaces, reduced.
    - Enderteritis may be present.
    - Absence of capillaries may give a homogenous appearance.
  4. Microscopical examination—Collection of small round cells resembling miliary tubercles, may be seen.
- Treponema Pallida may be found in some cases.

#### TUMOUR.

Myxoma fibrosum, commonest.  
 Angioma, fibroma and sarcoma have been found.  
 Chorio-angioma, when connected with chorion by a pedicle.

#### INFLAMMATION.

Seen in gonorrhœa, syphilis and pyæmia.

**TUBERCULOSIS**—Rare. Tubercle bacilli like malarial parasites and melanotic bodies are capable of passing through the villi into foetal circulation, but it is very rare. In the vast majority, the disease is not transmitted to the foetus through the placenta unless there is separation or abrasion of the surface.

**CALCIFICATION**—Fatty and calcareous degeneration are found towards the end of pregnancy. Usually it consists of a number of scattered points. They are probably caused by deposition of calcium in the necrotic tissue around the fastening villi and decidua basalis.

**ABNORMAL ADHESION** or *placenta accreta*—Very rare.

Caused by imperfect development of decidua or excessive proliferation of the chorionic villi invading the underlying muscle. The placenta cannot be separated from the uterine wall and hysterectomy is necessary when diagnosed.

### ABNORMALITIES OF THE CORD.

#### 1. INSERTION.

Velamentous, attached to the membranes at a distance from the placenta.

Marginal, attached to the margin of placenta.

#### 2. SHORT CORD.

(1) Apparent—due to the cord being wound 2 or 3 times round the foetus.

(2) True—When the length is shorter than normal.

#### 3. KNOTS.

True knots, produced by the foetus passing through a loop of the cord.

False knots,

(a) Localised thickening of Whartonian jelly.

(b) Varices of the umbilical vein.

## CHAPTER VI

# DISEASES ASSOCIATED WITH PREGNANCY.

## PYELITIS OF PREGNANCY.

Inflammation of the pelvis of kidney.

Usually comes on about the fourth month of pregnancy.

Is a very common cause of fever and pain during pregnancy in tropics. The almost constant presence of intestinal parasites e.g., thread worms etc., may explain this frequency.

### Pathology.

#### ÆTIOLOGY.

More common in primigravidæ.

Usually the right side is affected.

Cause,

Right ureter is more liable to compression by the uterus, owing to,

(a) Normal obliquity of the uterus to right.

(b) Right ureter lies further from the middle line than the left and so is less protected by the promontory.

Compression causes stasis, which predisposes to infection.

Constipation is often associated.

Infection from the bowel is not probable, as in that case left kidney would be more frequently affected.

Infecting organism—*Bacillus Coli*.

#### MORBID ANATOMY.

##### MILD CASES.

Catarrhal inflammation of the renal pelvis and ureter.

Exudation of pus and desquamation of epithelium.

##### MORE SEVERE CASES.

Kidney, pale in colour, soft, slightly enlarged, pelvis dilated and injected. Small abscesses may be present.

Ureter, right ureter is dilated above the brim of the pelvis, below the brim, normal. Mucous membrane thickened and injected.

Bladder, may not show any abnormality at all.

Organism, *B. Coli*, alone or associated with staphylococci.



**SOURCE OF INFECTION.**

1. Blood stream—Most likely. Organisms are always being excreted in the urine; when the urinary tract is damaged, it easily gets infected.
2. Urinary tract—Ascending infection from bladder. Not likely, as cystitis very seldom precedes.
3. Intestinal lymphatics—Directly from the intestinal tract to the kidney. Not likely, as streptococcus faecalis is never found.

**Clinical features.**

**ONSET**—Acute pain in the loin, shivering, fever, tongue furred, pulse rapid, tenderness and resistance in the loin and iliac fossa. Urine is acid in reaction, contains pus and B. Coli (on culture), and blood in very acute cases. Leucocytosis, about 20,000 per c. mm.

**COURSE.**

## 1. MILD CASES.

Temperature settles down in 2-3 days.

Pain subsides but relapses may occur.

Urine may continue to contain pus and B. Coli.

## 2. SEVERE.

Symptoms are more acute.

Higher temperature, more rigors, pulse about 120.

Excruciating pain in the loin.

Urine loaded with pus and large numbers of B. Coli.

Fever generally subsides in a fortnight.

Patient is liable to get exacerbation of the symptoms, and relapse.

## 3. COMPLICATED.

Initial attack very severe.

Blood and large amount of pus in urine.

Patient toxic and delirious.

Fœtus generally dies.

Pyelonephritis with pyæmia causing rigors may develop.

**Prognosis.**

Maternal mortality, low.

Death is usually due to pyæmia or septicæmia.

Fifty per cent. gets relapse of the attack.

Child—Abortion or premature labour may occur.

**Diagnosis.**

Main points for diagnosis,

(i) Fever.

(ii) Pyuria, B. Coli on culture.

(iii) Pain and tenderness in the kidney region.

Differential diagnosis.

1. Appendicitis,

(i) No pus in urine.

(ii) No tenderness or rigidity in the loin, except in retro-cæcal type.

- (iii) Signs and symptoms point to disease of the alimentary system, e.g., skin pin test and Rovsing's and Baldwin's test.
- 2. Renal calculus—X-rays.
- 3. Tuberculous disease of the kidney.
  - (i) General condition.
  - (ii) Symptoms more chronic.
  - (iii) Tubercle bacilli may be demonstrated in urine.
  - (iv) X-rays.
    - May show calcification.
    - May show cavities, with uroselectan.
- 4. Influenza—No pus in urine.

### **Treatment,**

Bed.

Milk and plenty of water to drink.

Hot fomentations in the loin.

Mixture containing, pot. citras 30 grains, tinct. hyocyanus 10 minims, every two hours.

At the end of one week urotropine 10 grains with acid sodium phosphate 25 grains every six hours, or urotropin intravenously.

To prevent relapse and exacerbation—Auto-vaccine starting with a dose of 5 millions and gradually increasing to 30 millions.

Renal pelvis may be irrigated through a ureteral catheter, but it may injure the ureter.

If symptoms are severe and do not respond to treatment—Induce abortion.

In pyonephrosis—Nephrotomy may be required but the patient usually recovers after evacuation of the uterus.

### **HEART DISEASE IN PREGNANCY.**

Commonest conditions of heart associated with pregnancy—Myocarditis or valvular disease or both.

Myocarditis—Contractile efficiency is impaired by the action of toxins and infective organisms; very common in tropics.

Mitral valve—Most commonly affected, either stenosis or regurgitation or both.

### **Clinical Course.**

Patients who suffered from heart disease before pregnancy, breathlessness is increased. Those who never experienced any heart symptoms may pass through pregnancy without any trouble, or the extra strain of pregnancy may cause breathlessness or limitation of 'reserve force' so that breathlessness can be induced more easily by exertion. If she had serious rheumatic myocarditis before pregnancy, compensation will soon break down. As pregnancy advances, compensation breaks down more and more, and when it breaks down entirely, symptoms of heart failure supervene.

**EFFECT OF PREGNANCY ON HEART DISEASE.**

1. Increased damage to the heart.
2. Failure of compensation—Primigravidae 15 per cent., multiparæ 30 per cent.
3. Sudden death from heart failure due to,
  - (a) Raised blood pressure, late in pregnancy or during labour.
  - (b) Strain of labour and then sudden drop of blood pressure immediately after labour, from lowered intra-abdominal pressure or postpartum hæmorrhage.

**EFFECT OF HEART DISEASE ON PREGNANCY.**

1. Abortion; premature delivery.
2. Postpartum hæmorrhage.
3. Adherent placenta.

**Prognosis.****1. HISTORY.****(a) OF HEART DISEASE.**

Rheumatic attack—Most damaging; if repeated in the last three years, it should be regarded as serious.

**(b) OBSTETRICAL HISTORY.**

If she has passed through several pregnancies since the last heart attack without any trouble—Outlook is good.

If she had cardiac trouble in last pregnancy—It will be more serious in the present pregnancy.

**(c) DEGREE OF CARDIAC INSUFFICIENCY BEFORE PREGNANCY.**

If there were no symptoms before pregnancy—It is likely that there will be no trouble.

If she has been suffering from heart trouble—Generally she becomes worse and experiences limitation of cardiac activity, precordial pain, anxious expression.

**2. SYMPTOMS.**

(a) Dyspnoea on exertion, palpitation and precordial distress—Prognosis fairly good.

(b) Oedema of lungs, cyanosis, hæmoptysis, albuminuria—Prognosis more serious.

(c) Rapidity of development of fresh symptoms—Bad.  
Appearance of fresh symptoms—Bad.  
Symptoms not increasing—Good.

(d) Response to rest and treatment.  
If improves—Good.

**3. VARIETY OF LESION.**

**MITRAL STENOSIS**—Supposed to be a serious lesion, but prognosis is good so long as compensation is good, and myocardium is not seriously involved. The degree of dilatation or its increase, as pregnancy advances gives a good indication of the condition of heart.

AURICULAR FIBRILLATION indicates myocarditis and cardiac failure but prognosis depends on response to treatment. Fibrillation may start in puerperium and steps should be taken to prevent it. Not uncommon in tropics.

**Treatment during Pregnancy.**

1. MILD CASES—Not exhausted by ordinary effort.

Rest.

Avoid undue effort.

Keep the bowels open.

Apply forceps early in the second stage of labour.

2. MODERATE—Heart is easily exhausted by moderate effort. Confined to bed for one month and then allowed up if compensation is good.

Digitalis 20 minims, three times a day.

Induce labour about the 37th week.

3. WHEN COMPENSATION HAS BROKEN DOWN,

Strophanthin 1/100 gr. four hourly.

Venesection—If veins are engorged.

Digitalis 30 minims, three times daily and injection of 5 grs. of camphor in oil.

Calomel and saline for keeping bowels clear.

Nepenthe 15 minims, potassium bromide 30 grains for sleeplessness.

Labour is disastrous during a period of cardiac failure; so give sedatives *e.g.*, morphia, bromides, freely and oxygen to relieve cyanosis (cyanosis causes increased irritability of uterus).

Up to twenty-fourth week of pregnancy—Termination of pregnancy by abdominal hysterotomy, preferably combined with double ligation and resection of portion of tubes.

After twenty-fourth week of pregnancy—Little is gained by induction of premature labour before the 36th week; so induce labour or do Cæsarean section, preferably under spinal anaesthesia, about that time.

4. AFTER LABOUR—Sand bag on abdomen and tight binder.

PREGNANCY SHOULD BE FORBIDDEN in the following cases,

- i. 'Reserve force' distinctly limited and does not respond to treatment.

- ii. If heart is dilated and œdema of the legs and lungs are present.

- iii. In disorderly irregularity.

- iv. Mitral stenosis with diastolic murmur.

- v. Aortic lesion, unless the muscle is very good.

**Advice to mother.**

PREGNANCY MAY BE UNDERTAKEN in cases of,

- i. Good response to effort and no dilatation.

- ii. Good recovery from cardiac failure.

- iii. In mitral stenosis if only presystolic murmur is present and the condition of the muscle is good.

**ANÆMIA OF PREGNANCY.****Ætiology.**

Occurs in women under the age of 25-30 as a rule.

It is quite a different disease from Addison's anæmia.

Addison's anæmia is essentially a chronic disease, occurring mostly in men, after the age of 35, runs a chronic course characterised by remissions and is not curable by blood transfusion.

It is more common among Hindus in Calcutta and Mahomedans in Bombay and is most prevalent in the latter half of the year.

Multiple pregnancy predisposes to the disease.

McSweeney thinks that syphilis may cause the disease in 15 per cent.

Chronic albuminuria in 30 per cent.

Ankylostomiasis, kala-azar, malaria may mask the disease and delay diagnosis and treatment.

**Clinical features.**

Skin—Lemon yellow colour.

Puffiness of face and eyes and œdema of the feet.

May complain of poor vision, sore mouth, weakness and vertigo.

Fever may be present. No hypochlorhydria.

Blanched mucous membrane, retinal hæmorrhages, sore tongue and enlargement of liver are usual.

Blood picture resembles that of pernicious anæmia, but the diameter of R. B. C. is increased. This megalocytosis is an important feature. The colour index is high.

The hypoplastic type due to bone marrow hypoplasia is the most common form of anæmia seen in Bengal and is the most refractory to treatment.

Bile pigments in the urine are increased.

Fifty per cent. of the patients have albuminuria.

Spleen may be enlarged.

Anæmia may come on insidiously, in the latter half of pregnancy or even shortly after delivery.

Miscarriage or premature birth is the rule; P. P. H. rare.

The child does not suffer from anæmia. But may be rachitic later.

The disease may progress very rapidly causing death in a week's time.

**Treatment,**

Unless patient quickly reacts to treatment in **early** months, we recommend induction of abortion or hysterotomy. Treatment by iron and arsenic is rarely any good. But liver by mouth and hepatex (P.A.F.) intravenously together with sunlight, proper feeding, marmite etc., will improve the patient. We find that transfusion of citrated blood is the only real treatment, beginning with 100 c.c. weekly upto 300 c.c.; larger quantities tending to cause premature labour. Whole blood injections are useless except as protein shock therapy. It is important that stools, urine and blood should be properly

examined, lest intestinal parasites, streptococci, kala-azar etc., defeat above lines of treatment.

The patient should avoid further pregnancies as the anæmia frequently recurs.

## OSTEOMALACIA.

It is fairly common in Northern India and is prevalent among those communities who observe strict *purdah*. In Bengal it is common among Marwari and Mahomedan women, and occasionally cases are seen in the poorest class Hindus.

It is a deficiency disease and can be successfully treated by calcium and cod liver oil, together with sunlight.

### Clinical features.

The disease appears in five different forms, anæmia and irregular menstruation being constant features, together with neuro-muscular pains. It may occur before puberty and after the menopause.

#### FIRST TYPE.

Symptoms of anæmia and tetany are present.

Hyper-irritability of the muscles and exaggerated knee jerks.

Trousseau's sign is easily obtainable. Cramps, a marked complaint.

#### SECOND TYPE.

Symptoms are mainly gastric or intestinal.

Distension of abdomen.

Inability to digest food.

THIRD TYPE—Rheumatic or bony pains about the shoulder girdle, thigh or back, worse on rising, sitting and walking.

#### FOURTH TYPE.

Symptoms of mild neuritis e.g., facial neuralgia, toothache or formication.

Lower limbs may be paralysed.

#### FIFTH TYPE.

ACUTE FORM—Severe attacks of pain in the bones and the patient may not be able to walk, the pelvis and long bones being crumpled and twisted.

CHRONIC FORM—Pains are not so severe.

Lordosis or kyphosis and waddling gait are usual.

Gradually the patient becomes hopelessly crippled.

Triradiate pelvis or great outlet contraction.

### Treatment.

PROPHYLACTIC—A sufficient quantity of vitamins, specially A and D, in the food are essential. Cod liver oil contains an abundant quantity of vitamins A and D, but these can only be assimilated in the presence of sun light. Sun light and exercise activate the calcium metabolism. Milk, ghee, fish, liver and eggs are very useful. A suitable supply of salts, proteins and carbohydrates must be provided.

If a patient has recent or early osteomalacia and is pregnant, energetic treatment on the lines laid down will, in many cases, cause cessation of signs and symptoms of disease and so prevent disaster to mother and baby during child birth.

**CURATIVE**—Sun light, cod liver oil and exercise are essential. In every severe cases 2—6 c.c. (in gradually increasing doses) of sodium morrhuate should be given intravenously, bi-weekly. Freshly made irradiated cholesterol is very useful. It can be prepared by exposing half an ounce of the pure drug to the rays of mercury quartz lamp for an hour at a distance of one foot; it is then dissolved in paraffin, two drachms being used for eight grains. Or prescribe radiostoleum (vitamins A and D). Calcium injections should be given intramuscularly; 2 c.c. of Crooke's colossal calcium may be used for the purpose. In addition to remedying the defects in vitamin D in the diet, it is necessary to secure an adequate intake of calcium and phosphorus. For in this disease a low serum inorganic phosphorus is present associated with a low serum calcium. We have found great benefit from calcium phosphates in doses of one to two drachms daily for six weeks.

The difficulties in labour can be avoided by antenatal diagnosis and treatment of the disease. In case of bad deformity, lower segment Cæsarean section is the treatment of choice, but in some case of very serious crippling McCann's Cæsarean section is the best. *Vide*, p. 269, 270.

These cases are however often seen very late in labour and it may be then discovered that on account of the crippling deformity of the outlet and cavity craniotomy is not even possible. In such a case in order to obviate certain rupture of the uterus the only procedure left to the surgeon is Cæsarean section with or without hysterectomy.

Osteomalacia is one of the commonest causes of pitiful vesico-vaginal fistulæ which are high up and unget-at-able and the only treatment of which is a transplantation of the ureters into the pelvic colon. The infant born alive of osteomalacic mothers may be born with rickets or early show symptoms and signs thereof. They should be treated from the first day with sun light, cod liver oil etc.

### CHRONIC NEPHRITIS.

It is a serious complication as the kidneys have to excrete not only the products of increased maternal metabolism but also those of the foetus. As a rule the disease had been present before pregnancy. This is a common condition in the tropics.

#### Symptoms.

No symptoms may be present or they may appear at any period in any degree of severity.

History of scarlet fever or diphtheria, malaria, kala-azar and dysentery.

Headache, cedema of the legs, vomiting.

Hypertrophied heart, thickened radial arteries, raised blood pressure.

Urine contains albumen and casts.

General condition becomes more serious as pregnancy advances.

**EFFECT OF PREGNANCY ON CHRONIC NEPHRITIS,**

1. Further damage to the kidneys which is permanent.
2. Each succeeding pregnancy accentuates the disease.

**EFFECT OF CHRONIC NEPHRITIS ON PREGNANCY,**

1. More liable to miscarriage and premature labour.
2. Accidental hæmorrhage and albuminuric retinitis.
3. Child may die before birth.

**Diagnosis.**

For differential diagnosis of pre-eclamptic toxæmia and chronic nephritis, *vide*, p. 42.

**Prognosis.**

Child—bad, death or ill-conditioned dies shortly afterwards.

Mother—Kidneys more damaged.

Contra-indications for further pregnancy,

- i. Blood urea higher than 40 mg. per 100 c.c.
- ii. Urea concentration test below 1.5 per cent.

**Treatment**—Same as pre-eclamptic toxæmia.

**INDICATIONS FOR TERMINATION OF PREGNANCY,**

1. Albuminuric retinitis.
- 2 Quantity of albumen increasing and patient becoming worse in spite of treatment.

Williams advocated sterilisation or use of contraceptive measures for women suffering from chronic nephritis.

**SYPHILIS.**

One of the commonest causes of premature interruption of pregnancy.

Usually the primary sore is not noticed, but Wassermann reaction is always positive.

Child is usually born dead; less frequently it is born alive with definite manifestations of syphilis and in a still smaller number of cases, born without any signs of syphilis, which may appear later on, such as keratitis, otitis, teeth etc.

**INFLUENCE OF SYPHILIS ON PREGNANCY.**

1. Infection before pregnancy or at the time of conception—  
Premature labour or expulsion of macerated foetus.  
Child is always syphilitic.
2. Infection during pregnancy.
  - (a) Within the first few months—Child syphilitic, unless treatment energetic.
  - (b) In later months of pregnancy—Child may escape infection.
3. Two per cent. of foetal deaths caused by syphilis.



**MANAGEMENT.**

In every suspected case of syphilis, Wassermann reaction of the mother should be tested and if positive, antisyphilitic treatment carried out. If treatment is started even four months before the birth of the child, there is reasonable prospect of getting an uninfected baby. In some antenatal clinics, the Wassermann reaction is done as a routine procedure.

A syphilitic child may be suckled with impunity by its mother but it must not be given to a wet nurse.

**GONORRHOEA.**

**CHRONIC** form may be associated with pregnancy.

Purulent discharge increases as pregnancy advances.

Irritability of the bladder may be present.

**ACUTE**—When contracted during pregnancy. It is more serious.

Soreness and swelling of vulva.

Ulcers may be present or polypoid condition of mucous membrane of vagina or orifice.

Copious discharge.

Difficulty in micturition.

**DANGERS.**

1. Conjunctivitis of the child, which may lead to blindness.

2. Patient is more liable to puerperal infection, generally by secondary pyogenic organisms.

3. May cause vulvo-vaginitis in a female child.

4. Acute gonococcal septicæmia.

**DIAGNOSIS**—Microscopical and cultural examination of the pus.

**Treatment.**

**IF DISCHARGE HAS BEEN PRESENT BEFORE PREGNANCY.**

Astringent vaginal douche.

Protargol pessary (15 per cent.) at bed time.

Painting the cervical canal with 15 per cent. protargol or mercurochrome.

Erosion cauterised with silver nitrate, electric cauterly or Hobbs' treatment with glycerine.

If purulent discharge from the urethra—Swab it with protargol.

**CASES INFECTED DURING PREGNANCY.**

Keep the patient in bed.

Irrigation of vulva. Hot sitz bath.

Vulva painted with 1 per cent. silver nitrate.

Inject 1 drachm of 1 per cent. protargol into the vagina once a day.

When acute symptoms subside,

Potassium permanganate douches.

**IN LABOUR.**

Vagina swabbed dry and painted with mercurochrome 1 per cent.

**PUERPERIUM**—Sitting position assumed as early as possible. Gonococcal puerperal sepsis is not uncommon in the tropics.

These cases with care as a rule get well and the fever subsides. A pyosalpinx or pelvic abscess frequently has to be opened by posterior colpotomy during puerperium.

**CHILD'S FLYE**—Drop 2 per cent. silver nitrate solution after birth. Argyrol drops twice daily, for 6 days.

## TUBERCULOSIS.

### EFFECT OF PREGNANCY ON TUBERCULOSIS.

1. The disease progresses very rapidly in tropics.
2. Healed lesions may become active.
3. Puerperal condition is very bad,
  - i. May get fever in the evenings.
  - ii. Cough may reappear.
  - iii. Sputum becomes more copious and full of tubercle bacilli.

### EFFECT OF TUBERCULOSIS ON PREGNANCY,

- i. When the disease is advanced, women are less fertile.
- ii. Direct infection of the foetus is rare, but it is possible. The child, after birth, living in the same environment, may be infected by the mother in 70 per cent.

### Treatment.

1. Sanatorium treatment.
2. Seen in the first eight weeks of pregnancy.
  - (a) Induce abortion if disease is active or X'ray picture shows much disease.
  - (b) If the disease has been dormant for some time, and there is a reasonable chance of the patient passing through pregnancy, with medical treatment if necessary, without further damage, pregnancy may be allowed to progress.
3. Later in pregnancy
 

Labour must not be induced unless it appears that the mother is going to die before labour starts, and the child is viable.
4. Make labour as easy as possible. Cæsarian section is best treatment to obviate hæmoptysis.
 

Apply forceps as soon as os is fully dilated. Mother should not suckle the baby and should be warned about the possibility of infecting the child by kissing.

## FEVER DURING PREGNANCY.

Symptomless fever, high or low, oftentimes causes great anxiety. For, apart from the malaise there is always the risk of premature delivery or mis-carriage with ensuing complication. Therefore every case should be diligently investigated and treated with care. The blood should be first properly examined with a

view to malaria and kala-azar and if either be present the treatment should be on the recognised lines.

If there is definite leucocytosis bear in mind that hepatitis and pyelitis are both very common in the tropics and that there may be no dull pain or enlargement in the liver or lumbar regions to assist diagnosis. On the other hand the eosinophilia of worms and filaria may be helpful.

A Wassermann or Widal reaction may throw light on a doubtful case. Also the urine will often give positive result if a catheter specimen can be cultured or pus cells found in abundance *e.g.* pyelitis.

Many times we have seen cases of fever undoubtedly due, as has been proved later, to degeneration of the placenta or small hæmorrhages into the placenta or between it and the uterine wall. In these cases there has been but little abdominal pain and scanty albumen in the urine. But as the fever progressed the foetus died and later was extruded. Therefore in all doubtful cases, watch the foetal heart sounds, if there be fever with albuminuria; for, the pyrexia is due to absorption and necrobiosis.

In severe cases an examination of stools will give information regarding organisms, ova, amœba, ankylostomiasis etc. In others X-rays will perhaps point to early tuberculosis.

Dengue and sandfly fever are always a source of anxiety; for the fever is high and all examinations may be negative. But in the absence of malarial parasites or over 15 per cent. large mononuclear cells it is always wise to withhold quinine and treat the case symptomatically with Dover's powder and aspirin etc. until the 7th or 8th day.

On more than a few occasions we have seen cases diagnosed as chronic malaria or kala-azar which have proved to be leukaemia. Such a mistake in a country where enlargement of the spleen is so common is perhaps easily comprehensible.

Finally, bear in mind that anaemia alone whether of the chlorotic or pernicious type, is in its early stages often accompanied by fever before the blood shews its typical features.

## MALARIA.

Ordinary forms of malaria have but little influence on the course of pregnancy. The high temperature may cause death of the foetus or premature labour, specially in the malignant type.

Quinine should be given unhesitatingly 10 grs. doses B.D. with 30 grs. of bicarbonate of soda or 1½ grains of atebrian thrice daily for 5 days, as its oxytocic properties are in abeyance under such conditions. If the fever is not reduced by quinine, the high temperature may cause death of the foetus or premature labour. If the placenta is injured or partially separated by pyrexia, the foetus may be born with malarial parasites in its blood.

**KALA-AZAR.**

It is by no means uncommon to see gross enlargement of the spleen accompanying pregnancy. In some of these cases there is no fever, nor is the anaemia marked; but if the condition is not realised miscarriage or premature labour almost invariably results as the growing uterus is impeded by the enlarged spleen.

Many of these cases are thought to be chronic malarial enlargement of the spleen and treated as such but no improvement occurs. In our experience in Bengal such enlargement is almost invariably due to kala-azar which may be latent for the time being. In such a case a Chopra or formol-gel test is not necessarily positive, but the reaction to antimony in the form of stibosan 2 per cent. given twice weekly is immediate. We have noticed that the reaction of the reticulo-endothelial system in these patients with or without fever is enhanced by milk injections given alternately with the stibosan.

Kala-azar accompanying pregnancy is by no means rare in Bengal and if efficiently treated does not tend to jeopardise the pregnancy, provided the anaemia and general hygiene of the patient are borne in mind.

**INFLUENZA.**

Pregnancy makes very little difference in the course of the disease. Abortion or premature labour is more liable to occur. Onset of pneumonia is serious; outlook becomes more and more serious as pregnancy advances.

**TREATMENT.**

Usual medical treatment, with the exception of quinine.

Sedatives to quieten the uterus, *e.g.*, bromides, belladonna, opium.

In pneumonia—Oxygen inhalation to prevent cyanosis.

High temperature—Tepid sponging.

**BOWEL DISEASES DURING PREGNANCY.**

In Bengal and some other parts of India *hookworm disease* is very common. This disease may be contracted by ingestion of the ova with food, but the main root of infection is through the skin, generally of the feet. The infested mud lodges between the toes, thence the larvæ dig their way into the skin and eventually reach the blood-stream and lungs, whence they are swallowed from the pharynx.

The main symptom of hookworm disease is anaemia, which may cause oedema, restlessness and, at times, albuminuria. Such symptoms might suggest in a tropical country malaria, kala-azar, or toxæmia of pregnancy, for it is not uncommon for many tropical diseases to be found in one patient, but if the possibility of ankylostomiasis is borne in mind the worm or its ova will be discovered in the stool and eosinophiles in the blood.

We have observed that there is one peculiar trait common to these patients, namely, that the skin and hair are of a peculiar dry dull appearance, due to a deficiency in oil.

Hookworm disease, in some cases, is a cause of abortion, probably due to foetal anoxæmia. In other cases the degree of dropsy and anæmia may be so great as to precipitate a wrong diagnosis, such as pernicious anæmia of pregnancy or pregnancy nephritis, or secondary cardiac failure. Such an error is of a peculiar importance in India, where pregnancy anæmia, due to dietetic error, and particularly to a lack of vitamins A, B and D in the food, is so common. For it has been established that if hookworm disease of any severity is allowed to progress undiagnosed during the latter months of pregnancy, eclampsia, secondary to the morbid conditions of the kidney and liver produced by the hookworm, may result.

Rowan has published 19 cases of eclampsia in the Mississippi Valley, in which only 2 were free of hookworm infection, and during the last few years we have seen 12 cases of eclampsia secondary to ankylostomiasis. In Bengal and Madras, where the incidence of eclampsia is so great, it is probable that if the stools of every anæmic pregnant patient were examined properly, hookworm disease would be found in a large majority, and progressive anæmia, premature delivery, eclampsia and death of the foetus or of the mother would be prevented by treatment.

As regards medication one need have no fear, for thymol in large doses or carbon tetrachloride or oil of chenopodium (provided the drugs contain no impurity) are not injurious to the foetal or maternal organism. The treatment, whatever drug be used, should be repeated several times, as one treatment usually fails to remove all parasites. Moreover, the thoroughness of such treatment should be checked by repeated stool examinations.

Hookworm infection is very common in the tropics; therefore the clinical picture of progressive anæmia with or without the albuminuria indicates stool examination, with a view to treatment and prevention during pregnancy.

### DYSENTERY.

Dysentery during pregnancy is very common in India. 70 per cent. are Flexner infections, 15 per cent. amœbic and 15 per cent mixed bacillary plus amœbic.

Often its importance is not appreciated, because it begins with a mild attack of diarrhoea without blood or mucus. It may be thought to be of an irritative nature and treated on the usual lines, but it continues, with the passage of mucus and blood, over many weeks. Whatever the condition, it is imperative to investigate every case, for death of the foetus, miscarriage or premature labour and possibly death of the mother may result. Remember that the stools should be examined, if possible, before beginning treatment, for if emetine is empirically prescribed it

may cause abortion. Hence we advise kurchi or kurchibine in *amœbic dysentery*.

The griping and tenesmus of *bacillary dysentery* are frequently the cause of premature uterine contractions. Therefore, if saline treatment is adopted, it is advisable to give starch and opium enemata or injections of heroin to inhibit sympathetic uterine peristalsis. During the last few years we have had excellent results (after preliminary purgation) with bacteriophage given thrice daily or 4-hourly in fulminant cases. In other cases we have had equal success with injection of 40 cc. of polyvalent antidyenteric serum. This is repeated 3 days running.

From time to time one sees dysentery without fever which is progressive and accompanied with great wasting and anæmia. These cases, when pregnant, are perhaps the most difficult of all, for ordinary stool examination shows no intestinal parasites or any kind of protozoa and no pathogenic intestinal organisms of any kind. Moreover they react to no empirical or other treatment such as diet, santonin, thymol, bismuth, emetine, calcium, kurchi, etc. We would suggest, as a result of much clinical experience, that these cases are similar to the gastrointestinal upset seen in osteomalacia, in the anæmia of pregnancy, and in the rickety infant; and that they are due to a *diet deficiency*, and particularly a deficiency of vitamins A, B and D with acalœmia; for the growing foetus is a parasite robbing the mother of calcium.

Moreover, if one investigates the previous diet of these patients, and can discover by examination of the blood that there is a low serum calcium and inorganic phosphate content, the diagnosis will be confirmed.

The treatment should be proper dieting, sunlight and exhibition of calcium. Vitamin A is contained in foods which are, as a rule, well tolerated by these patients; for instance, fresh milk, yolk of egg, raw meat-juice, liver, fish-roe, fresh butter, and ghee if not adulterated. Vitamin D is supplied to man by the action of the sun's rays upon the skin, but can be given in synthetic form in the shape of radiostoleum or irradiol or ultra-violet radiation. In the way of drugs the best results are obtained from intravenous sodium morrhuate 2 c.c. on alternate days, with 2 c.c. intramuscular injections of calcium and calcium and parathyroid by mouth.

Occasionally sore tongue and epigastric pain, with distension and palpitation of the heart and extreme nausea, are urgent symptoms during pregnancy. In such a case proper dieting and a powder of 5 grains each of magnesium carbonate pond., calcium carbonate and bismuth oxy-carbonate given 2 or 3 hourly will be found efficacious. Intestinal disinfectants, such as mercury, dimol, yatren and stovarsol, are of no value in our experience.

Lastly, despite all treatment, one will, from time to time, meet with cases which persist. In such cases a reliable laboratory worker may discover that the cause of the frequent stools, anæmia, sore tongue and prostration is due to a *streptococcal infection of the gut*, which causes such changes in its wall as to

allow the organisms to pass into the general circulation. If an auto-vaccine of such a streptococcal invasion can be prepared and given in addition to dietetic measures, dramatic results may be obtained.

The dysentery of the puerperium (*sutika*) which is so common in the tropics, is a very serious matter. Most of these cases are originally Flexner infections, which are replaced by a hæmolytic streptococcus causing severe anæmia and a great mortality, death being hastened by toxæmia.

Cholera during pregnancy, is a very fatal disease. The vomiting and cramp precipitate abortion or labour. Therefore intravenous saline, alkalies and glucose are imperative. In the presence of an epidemic anti-cholera serum should always be given.

### SPRUE.

This condition is not at all uncommon during pregnancy and is a cause of great anxiety, for whether this disease is associated with endocrine dysfunction, acalcræmia or a streptococcus in the bowel, while the fœtus remains *in utero* the condition of the patient progressively deteriorates; moreover, the child when born is of such deficient vitality as rarely to live.

During the last year five patients have been admitted into the Eden Hospital with sprue, all of whom had been under expert treatment elsewhere. Two had premature labour with death of the fœtus, three were confined at term. One baby had a large spina bifida, another incomplete ossification of the calvarium so that there was a space 2 to 3 inches wide from the nasion to the occipital protuberance, and a third complete double talipes and genu recurvatum. The mothers were pure Europeans, and these findings in the children would suggest that vitamins A, B and D deficiency was, in great part, the cause and effect of the disease.

### INTESTINAL WORMS.

Despite their great frequency in the tropics worms rarely cause serious symptoms, but from time to time one is called to cases of abdominal pains with or without intense vomiting during pregnancy, and in some patients the prostration may be so great as to alarm all concerned. One naturally would think of such conditions as pre-eclampsia, toxæmia, appendicitis or concealed accidental hæmorrhage, or possibly the twisting of a small ovarian cyst, etc. But one should bear in mind that cold clammy prostration, abdominal pains and vomiting may result from acute acidosis associated with worms.

If after clinical examination the doctor can exclude the more serious conditions mentioned above, he will gain great credit if by *santonin* and *calomel* he can demonstrate the cause of the patient's symptoms, the acidosis of course being treated on the usual lines—alkalies and glucose by mouth and rectum, or by vein if need be, the diet being corrected afterwards.

**APPENDICITIS.**

Perhaps due to the presence of worms, attacks of appendicitis are by no means uncommon during pregnancy in the tropics. An accurate diagnosis is essential, for delay in operating may mean the formation of an abscess or general peritonitis with subsequent miscarriage and death. It is important to remember that the cæcum and appendix are raised by the pregnant uterus and therefore the "guarding" rigidity and skin hyperæsthesia may be at or above the level of the umbilicus.

Unlike appendicitis in the non-pregnant the symptoms and signs are almost invariably relegated to the right flank, vomiting, fever and high leucocytosis being constant features. But these are features which are frequently associated with acute pyelitis which is more often right-sided than bilateral. Consequently it is essential to eliminate pyelitis of pregnancy. This can be done by taking a catheter specimen of urine and testing for albumen and pus cells and at the same time culturing the urine. The symptoms and signs of pyelitis at once react to drachm doses of bicarbonate of soda and potassium citrate, 2 hourly, whereas those of appendicitis progressively increase.

In our experience it is best to operate directly a sure diagnosis has been made. One of us has operated on many such cases and in only one death occurred due to general peritonitis and miscarriage. In 2 cases the diagnosis of acute appendicitis was simulated by acute torsion of the Fallopian tube and ovary. The tube and ovary were removed and the patients went to full term. In our opinion if a woman has had symptoms definitely positive of appendicitis, she should be advised to have that organ removed prior to marriage or pregnancy. For an acute attack of an appendicitis during pregnancy in a up country district is a very serious matter.

**ABDOMINAL PAINS DURING PREGNANCY.**

It is necessary not only to mention such causes as cholecystitis, pyelitis, accidental hæmorrhage, appendicitis, worms, fibroids and disease of the ovary which are very common in the tropics but also two conditions which frequently are unthought of or undiagnosed, the one being tetany, and the other referred pain in the abdomen due to vertebral causes.

**TETANY.**

Tetany is much more common than is realized and may be seen in women of all communities during pregnancy, if their diet is defective and they are anæmic.

One should remember that the foetus is a parasite who robs the mother of calcium, phosphorus and iron, etc. Normally such depletion is made good by a healthy diet and sunlight, but in the tropics a defective food supply, particularly a lack



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of iron, calcium and vitamins A, B and D in food-stuffs, with the avoidance of sunlight and exercise and the observation of *pardah*, all combine to favour the onset of tetany, the result being that the woman suffers about the 5th month onwards from abdominal or leg cramps, syncope, headache and a peculiar inertia. Some may develop laryngeal spasm, exactly as is seen in the rickety child, and become cyanosed and unconscious.

Frequently the condition is labelled as hysteria and treated as hysterical fits. In severe cases, where as a result of calcium deficiency a thin cloud of albumen is found in a non-catheter specimen of the urine, it is no uncommon thing for this type of laryngismus and cyanosis with or without fits to be diagnosed as pre-eclampsia. No greater error can be made, for if it is realised that the cause of muscular irritability or spasmophilia plus pregnancy is a part and parcel of the deprivation of the maternal blood of calcium and phosphorus etc., the treatment is obvious, whereas, if no diagnosis is made progressive anæmia may cause premature delivery and death.

Although the fœtus, true to its parasitic source of life, will be born apparently healthy, if immediate provision be not made to counteract its fœtal tendency to rickets it will shrivel and die. Maxwell Preston has recently amply demonstrated by radiograms and post-mortem examination that fœtal rickets exists in these infants born of tetanoid or osteomalacic mothers.

The treatment of tetany is sunlight, a full calcium and vitamin diet and cod-liver oil, irradiated ergosterol (radiostoleum or irradiol) and injections of calcium. In severe cases intravenous sodium morrhuate is of great value.

### Vertebral Causes.

It will be realized from what has been said that there is only a small dividing line between tetany and osteomalacia, but the earliest symptoms of osteomalacia are often undiagnosed, because practitioners only think of this disease in terms of great bony deformity, whereas that crippled condition is the last stage of long-standing symptoms.

Twenty-five years' experience of pregnancy conditions in every community has convinced one of us that diet and sunlight deficiency are responsible for an ever-increasing number of obstetrical difficulties.

In one type of patient the heart, abdomen and uterus are flabby and complications occur as described elsewhere. In another type tetany is easily demonstrated by symptoms or Trousseau's sign. In still another type, that is, the one we are concerned now about, the symptoms are apparently in the earlier stages referred to the spine and back, and the pain is referred from the back to the front of the abdomen. Almost invariably practitioners label such a case as muscular rheumatism

and treat it as such. But one should beware of so doing; for in the course of two or three months the patient may be unable to walk or sit or rise in comfort, so great will be her neuralgia.

In fulminant cases actual paralysis may occur while you are attending her, exactly as occurs in lathyrism and ergotism—diseases common in India dependent upon degenerative changes in the nerves as a result of a toxin in peas and rye which flourishes in the body when there is an absence or insufficiency of vitamin A in the diet.

## CHOREA.

### Ætiology.

- (1) Unstable nervous system of the patient or in the family.
- (2) History of chorea or rheumatic fever in childhood, and may be associated with heart lesions.
- (3) Some of them are toxic in origin and are very serious. Albuminuria and jaundice may be present.
- (4) More common in young primigravidae. Comes on about the third month of pregnancy. Must be very rare as only one case in 20,000 pregnancy cases was seen at Eden Hospital.

### Clinical features.

Onset—Usually insidious.

In pregnancy, movements are more violent, wasting is greater and tendency to mania is increased.

May persist throughout pregnancy in a mild form.

Movements usually cease after two month's treatment.

During labour movements may be increased but can be controlled by anaesthesia.

### Prognosis.

Generally good. Abortion occurs in 15 per cent., and due to foetal death.

Mortality is high in toxic cases.

Recur in subsequent pregnancy in 15 per cent., and is more serious.

### Treatment.

Rest. Isolation.

Remove the cause of worry.

Diet—Liberal in ordinary cases.

In toxic cases, fluids. Glucose and sodium bicarbonate solution rectally.

Drugs—Bromides, chloral or even morphia, when the movements cannot be controlled, and for insomnia.

Aspirin or sodium salicylate in rheumatic cases.

Evacuate the uterus if toxic symptoms are present, specially jaundice.

**HERPES GESTATIONIS.**

Probably toxic in origin.

**CLINICAL FEATURES.**

Lesions similar to those of herpes zoster.

Rash appears in buttocks and legs and then affect other parts of the body.

Pain and itching.

**TREATMENT.**

Bismuth and starch powder, locally

Mixture containing hypophosphites, arsenic and iron.

**GLYCOSURIAS IN PREGNANCY.**

Lambie describes four types of glycosuria of pregnancy,

1. **EARLY ALIMENTARY GLYCOSURIA**, which he believes to be due to hyperglycæmia.
2. **RENAL GLYCOSURIA** due to lowered threshold of kidney for sugar, from which 45 per cent. of women suffer.
3. **LACTOSURIA**.
4. **LATE ALIMENTARY GLYCOSURIA**.

**NOTE**—Both 3 and 4 are very common in the tropics due to increased carbohydrate diet of people. The prognosis of these types during pregnancy is excellent.

**CROOK** found that glycosuria associated with pregnancy were of three clinical types,

1. **ESSENTIAL**.

Normal renal threshold for sugar is 0.18 per cent.

In pregnancy the threshold is diminished and glycosuria can be produced by oral administration of 50 grammes of glucose, specially in the early months.

Blood sugar remains normal.

It may be caused by altered activity of pituitary and adrenal.

2. **TOXIC**.

Commences about the fifth month of pregnancy.

Blood sugar remains normal.

Toxic symptoms *e.g.*, loss of flesh, weakness, œdema and raised blood pressure are often present.

Urine does not contain any albumen.

**PROGNOSIS.**

Not known, at the present state of our knowledge.

Some of them probably end in true diabetes.

**TREATMENT.**

Should be treated as a case of toxæmia.

Glycosuria is easily stopped by carbohydrate restriction.

## 3. DIABETES MELLITUS OR TRUE DIABETES.

Blood sugar is raised.

**Prognosis.**

## 1. EFFECT OF DIABETES UPON PREGNANCY.

Produces functional disturbances of ovulation and in long standing cases causes atrophic and sclerotic changes in the ovary.

Menstruation is absent in 40 per cent. diabetic women and not more than 1.5 per cent. of them ever become pregnant. Insulin treatment may restore reproductive activity.

Hydræmnios is present in 27 per cent. of the patients.

Fœtus is often abnormally large. Mortality of child 50 per cent. and of those who survive, 80 per cent. die in the first few days.

Thirty per cent. of diabetics abort about the fifth month. Premature labour is quite common.

Patients are more liable to infection and maternal mortality varies from 25 per cent. to 30 per cent.

## 2. EFFECT OF PREGNANCY ON DIABETES.

Pregnancy may precipitate the attack in those who are predisposed to it or exacerbate the symptoms.

Diabetes may appear about the fifth month and disappear after labour.

Prognosis is better when diabetes starts in pregnancy than when pregnancy supervenes upon diabetes.

Fœtal islets of Langerhans are increased in size and may help utilisation of sugar later in pregnancy.

During labour there is increased combustion of sugar and this may give rise to acetonuria or even to coma.

A diabetic patient should not marry; if married she should be advised to avoid pregnancy. Prognosis is better for the first baby than the succeeding ones, but it is safe to let her carry on with insulin treatment.

**Treatment.**

Insulin treatment should be started as early as possible and continued throughout labour and puerperium.

Exposures to chill and infection must be avoided.

If the patient, seen early, does not respond to treatment—Induce abortion.

When severe acidosis is present, fœtus is probably dead and the uterus should be emptied.

In labour—Labour is better conducted under morphine and hyoscine\*anæsthesia.

Help the second stage by timely application of forceps.

If any complication is present—Cæsarean section under gas and oxygen or spinal anæsthesia.

During labour owing to increased metabolism, more insulin will be required, whereas after labour, metabolism is decreased and too much of insulin may produce hypoglycæmia; so the dosage of insulin must be guided by careful estimation of blood sugar.

### TRANSIENT ŒDEMA IN PREGNANCY.

Sudden transient œdema in pregnant patients from the 5th month onwards in whom the urine is practically normal except for a marked decrease in the chlorides, is not uncommon in the tropics.

For instance in the wife of a distinguished physician, the œdema occurred to an alarming degree, the legs and hands becoming enormously swollen and the face so puffy as to obscure vision.

In another the lips, abdominal wall and feet suddenly became œdematous; in neither was there any alteration or indiscretion in diet, but in both there was headache and heaviness. In both, during the attack, the chlorides fell to 0.1 per cent.

Recent research work at Queen Mary's Hospital, London, has shown that in cases of normal pregnancy there is a considerable decrease in the plasma bicarbonate, and that this decrease remains constant throughout the period of gestation.

Normally the water content of the blood is increased in pregnancy, and the lower the plasma bicarbonate becomes, the greater the œdema.

The administration of  $\frac{1}{4}$  to  $\frac{1}{2}$  ounce each of bicarbonate of soda and potassium citrate per day in water for a few days causes total disappearance of the œdema without any change in diet; at the same time the chlorides rapidly rise to 0.5 or 0.6 per cent. in the urine.

This therapeutic test is of importance, for cases of œdema, pre-eclamptic or otherwise, are very common in the East. Alkaline treatment promotes diuresis and diminishes the œdema, without the discomfort of sweating, purgation and extreme limitation of diet.

It may be observed that Clifford White some years ago demonstrated the fact that the administration of large doses of alkalies is of real value in the prognosis and treatment of pregnancy albuminuria and toxæmia and we can attest to its value.

### MORBID CHANGES IN OLD MULTIPARÆ.

In the East large families still are the rule. Because a woman has had several children without disaster it is a common error to presume that her record will continue to the end. But we and many others have demonstrated that the risks of childbirth progressively increase after the 4th pregnancy. The reason being

that there is a pathological calcium depletion in the pregnant woman as age advances due to overwork, underfeeding, and the stress of life associated with a big family. Such calcium depletion shows itself particularly in flabby uterine, abdominal and heart muscles.

Moreover, in some women in this country minor degrees of osteomalacia may occur in the pelvic bones which obstruct delivery, because the doctor has relied upon the previous history of normal pregnancies, and has made no pelvic examinations.

Our hospital records show that there were 27 "craniotomies" out of 104 during a period of 10 years on mothers between the ages of 30 and 40, all of whom had had many children before, and all of whom were admitted late in labour and already septic and with the child dead. In some of these the child was unduly large, in others an impacted posterior position was present, in a few the pubic rami had become beaked, and in almost all there was a history of primary and then secondary inertia associated with flabby atonic muscles, which were unable to exert the necessary expulsive movement on the foetus.

Old multiparæ are more prone to toxæmia of pregnancy, particularly to accidental hæmorrhage, revealed or concealed, due to renal and hepatic dysfunction. Hence the need for antenatal care as regards the diet, heart, blood-pressure, urine and symptoms. Remember the maxim that *"pregnancy is the most delicate test of renal function that we possess."*

Much can be done for these patients if seen in the last month of pregnancy by ordering 3 grains of quinine twice a day, or injecting  $\frac{1}{2}$  c.c. of pituitrin twice a day with a view to increasing the muscle tone. Honey is also useful both before and during labour.

One should be careful to see that there is no malpresentation, and if the abdomen is pendulous a padded binder is useful. On several occasions, rather than run the risk of intranatal disaster and possibly postpartum hæmorrhage, one of us has earned disapprobation by doing Cæsarean sections on such old multiparæ but he has never regretted it.

## ABNORMALITIES OF THE UTERUS.

### Malformation.

Pregnancy in the rudimentary horn of a bicornuate uterus is rare but dangerous, as there is no communication with the uterine cavity. Rupture is serious because it produces severe hæmorrhage. It occurs about 4th or 5th month.

Pregnancy in unicornuate, bicornuate and septate uterus—abortion frequent but may follow a normal course. Care must be taken that the non-pregnant part of the uterus does not interfere with labour. In that case either it should be pushed out of the way or Cæsarean section should be done.



**Decidual Endometritis.****A. ACUTE.**

Causes,

- (i) Ascending gonorrhœa.
- (ii) Attempts at criminal abortion.

**B. CHRONIC—Three types.****1. HYPERPLASTIC.****(a) GENERAL HYPERPLASIA.**

Commonest. Decidua thickened.  
Abortion in the first twelve weeks.  
Placenta may be adherent.

**(b) LOCALISED HYPERPLASIA—Thickening more localised.****(c) POLYPOID GROWTH—Projection of irregular knob-like masses from the inner surface of the decidua.****2. GLANDULAR.**

Hyperplasia of the glandular structures.

Profuse secretion of clear fluid may dribble out as rapidly as it is formed or may be discharged intermittently; this is known as *hydrorrhœa gravidarum*. Some authorities maintain that hydrorrhœa is caused by premature high rupture of membranes and discharge of liquor amnii, as lanugo hairs can sometimes be demonstrated in the fluid. But often times we have seen the true type for which there is no satisfactory treatment.

**3. ATROPHIC.**

Atrophy of the decidua vera and basalis.

May interfere with nutrition of the ovum and cause abortion.

It may give rise to the condition known as *placenta accreta*. Vide p. 78.

**Results.**

- (i) Abortion.
- (ii) Premature rupture of membranes due to adhesion between decidua vera and capsularis.
- (iii) Adhesion of the membranes and placenta to the uterus.
- (iv) Hydrorrhœa gravidarum.
- (v) Formation of placental polyp, caused by organisation of intra-decidual hæmorrhage.
- (vi) Sterility—Abnormal secretion interferes with impregnation and implantation of the ovum.

**TREATMENT.**

None during pregnancy.

Unhealthy mucous membrane curetted 3 months after pregnancy and the patient is put on French Codex iodine 10 minims once a day in milk for 3 months with thyroid  $\frac{1}{2}$  gr. once a day.

## TUMOURS COMPLICATING PREGNANCY.

### I. OVARIAN TUMOUR.

All varieties of tumours may be associated with pregnancy and are very frequently seen in the tropics. Dermoid, is the commonest tumour complicating pregnancy.

It is more dangerous than other varieties of tumours as,

- (i) It has a great tendency to remain in pelvis.
- (ii) It is more liable to cause peritonitis by torsion or inflammation.
- (iii) It is more prone to suppuration or degeneration or rupture.

In Bengal we have seen scores of ovarian tumours brought to hospital, diagnosed by midwives during the puerperium.

#### Effect of ovarian tumour on pregnancy.

1. Sterility.
2. Excessive sickness.
3. Pain.
4. Disturbance of micturition.
5. Abortion or premature labour.
6. Embarrassed breathing and circulation and other symptoms of increased intra-abdominal pressure.
7. Malpresentation.

#### Effects of pregnancy on the tumour.

1. Torsion of the pedicle, 6 per cent. when associated with pregnancy (normally 2 per cent.). Peculiarly frequent during puerperium.
2. Growth of the tumour accelerated.
3. Rupture.
4. Intra-cystic hæmorrhage.
5. Infection and suppuration.

**Symptoms**—No symptoms may be present.

Incarceration will produce pain, aching in the thigh, constipation and possibly retention of urine.

Very large tumours will produce pressure symptoms, *e.g.*, dyspnoea, pain, dyspepsia etc.

Rupture will produce sudden pain and shock and diuresis.

**Signs**—Round tumour apart from the uterus.

Fluid thrill.

Small intra-pelvic tumour may push the cervix forwards and upwards and simulate the foetal head.

#### Differential diagnosis.

1. Full bladder—Disappears on catheterisation
2. Retroverted gravid uterus—No other swelling distinct from the uterus.

Fornices of the vagina are drawn up.

3. Ectopic pregnancy—If differentiation is not possible by vaginal examination, abdominal section should be done in either case and whatever found is removed.

#### Treatment.

Remove the tumour as soon as it is diagnosed, in early months of pregnancy risk of abortion is under 15 per cent.

Delay,

1. When first seen late in pregnancy, a small uncomplicated cyst lying in the abdomen above the pelvic brim.
2. Child just short of viability when the tumour is discovered—Postpone operation until the child is viable and there is reasonable chance of survival. Do Cæsarean and remove tumour.
3. Presence of two ovarian tumours, removal of which will prevent further pregnancy—Oophorectomy at the time of Cæsarean section.

#### PRESSING INDICATIONS FOR OPERATIONS,

- (i) Infection.
- (ii) Incarceration.
- (iii) Overdistension of the abdomen.
- (iv) Tumour growing in the broad ligament.
- (v) Torsion.

#### PRECAUTIONARY MEASURES FOR OPERATION,

1. Morphia before operation.
2. Handle the uterus as little as possible.
3. Sedatives after operation.
4. Always use the abdominal route.

### FIBROID TUMOURS OF THE UTERUS AND PREGNANCY.

#### EFFECT OF TUMOURS ON PREGNANCY.

1. Sterility, specially when submucous.
2. Abortion or premature labour in 15—20 per cent.
  - (i) Myoma being submucous.
  - (ii) Embarrassment of breathing.
  - (iii) Irregular enlargement of the uterus.
3. Pressure symptoms, when impacted.
4. Sacculatation, when the tumour is in the wall of the uterus.
5. Accidental hæmorrhage.
6. Malpresentation.
7. Disturbance of micturition, when it is intra-pelvic.

#### EFFECT OF PREGNANCY ON FIBROID.

1. Becomes softer, larger and flatter—Mainly due to increased vascularity but partly to increased rate of growth as well.
2. Torsion—of pedunculated submucous myoma.
3. Degeneration—Usually 'red' degeneration or liquefaction.
 

Symptoms,

Sudden acute pain.

Pulse and temperature, raised.

## FIBROID TUMOUR OF THE UTERUS AND PREGNANCY 105

Tenderness of the tumour and rigidity of the overlying abdominal muscles.

### 4. Infection—Blood borne.

## DIAGNOSIS.

Fibroids may be difficult to detect when softened; if projecting and nodular, diagnosis is as a rule easy.

X-rays will show presence of the foetus.

Retroversion of a gravid-uterus.

## DIFFERENTIAL DIAGNOSIS.

### 1. Threatened abortion with degenerating fibroid or ectopic gestation,

Differentiation is usually very difficult and can only be made after repeated examinations.

Pain in the latter is more acute and sudden in onset.

When a woman is known to have a myomatous uterus, diagnosis is easy.

### 2. Phantom fibroid.

Localised contractions of the uterus.

Physical signs are altered at the next examination.

### 3. Symmetrical interstitial fibroid with amenorrhoea due to menopause—Signs and symptoms of pregnancy except amenorrhoea are absent.

## Treatment.

Active treatment is seldom necessary.

Operation is indicated only in the presence of some urgent symptoms, *e.g.*,

#### 1. Impaction with retention of urine.

#### 2. Degeneration, torsion, infection, or severe pressure symptoms.

#### 3. From the position of the tumour it is apparent that delivery per vaginam is impossible.

Operation in case of degeneration.

Child not viable,

Try myomectomy but abortion may occur in over 50 per cent.

If impossible,

Remove the child and then enucleate the tumour or remove the uterus.

Child viable—Caesarean section and then enucleation or hysterotomy.

Operation in case of impaction,

Try to disimpact by digital pressure, with the patient in genu-pectoral position, or in Sims' position if under anaesthesia.

Operation must be done by the abdominal route. The bed of the tumour must be carefully stitched after operation. In case of severe bleeding hysterotomy may be necessary.

Operation in case of torsion,

Remove the tumour and leave the uterus.

If the uterus is twisted as well,

Child viable—Caesarean section followed by hysterectomy.

Otherwise—Hysterotomy

If it is found that the tumour is going to obstruct labour, Caesarean section followed by removal of the tumour or hysterectomy, 1 or 2 weeks before the expected date of labour.

### CARCINOMA OF CERVIX WITH PREGNANCY.

Carcinoma during pregnancy is rare; but in the puerperium many are seen in India.

Mortality, mother—40 per cent., child—60 per cent.

#### SYMPTOMS AND DIAGNOSIS.

Blood stained discharge, which may be offensive.

Cervix enlarged, hard and rough.

Growth bleeds freely and is friable.

Induration and fixation of the cervix (late cases).

Microscopical examination will show carcinomatous tissue.

#### EFFECT OF PREGNANCY ON CARCINOMA.

Grows rapidly and rapid invasion of glands and lymphatics.

#### EFFECT OF CARCINOMA ON PREGNANCY.

(a) Abortion or premature labour, 30 per cent.

(b) Placenta praevia is not uncommon.

(c) Intrauterine death of the foetus.

#### DIFFERENTIAL DIAGNOSIS.

1. Threatened abortion,  
Cervix smooth and normal.  
No induration or friability.

2. Cervical erosion,  
No induration.  
Not friable.  
Microscopical examination.

3. Sloughing polypus—which may be mucous, fibroid, placental or sarcomatous, projecting from the cervix with a stalk: the finger can pass all round it; the rim of the cervix is dilated but healthy.

#### TREATMENT

If operable,

Pregnancy should be disregarded.

Early pregnancy—Wertheim's hysterectomy.

Late in pregnancy—Caesarean section followed by hysterectomy.

If inoperable,

First three months—Evacuate the uterus and treat with X-rays and radium.

Later in pregnancy—Pregnancy allowed to progress if possible and then Caesarean section about the thirty-sixth

week. This may be followed by subtotal hysterectomy as that lessens the chances of sepsis.

Radium and X'ray treatment before operation may be useful.

In cases where the child is nearly viable, it may be justifiable to wait a week or two before operation.

In the puerperium, vaginal hysterectomy followed by radium or deep X'rays.

## SECTION IV.—NORMAL LABOUR.

### CHAPTER I.

## PHENOMENA OF LABOUR.

**Labour**—Process which brings about separation of mature or nearly mature ovum from the mother by removing the former from the latter.

**Cause of onset of labour.**

No definite cause is known.

**Theories,**

1. Increasing distension and irritability of the uterine muscle.
2. Infarction of placenta.
3. Dilatation of cervix by the presenting part.
4. Thrombosis of decidual vessels.
5. Menstrual periodicity, heredity, habit or emotion.
6. Hormonic influences—Knaus has recently showed that pituitary extract acts more readily on the uterus in the later months of pregnancy but corpus luteum secretion renders the muscle fibres refractory to the action of pituitary extract. In the later weeks of pregnancy the inhibiting effect of the corpus luteum gradually diminishes with the result that the muscle becomes more susceptible to the effects of pituitary secretion and folliculin.
7. Diminution of oxygen in placental blood.
8. Metabolic products of the foetus, *e.g.*, increasing venosity of blood, toxic products of metabolism etc.

**Definitions.**

**CONTRACTION**—Temporary shortening of muscle fibre.

**RETRACTION**—Permanent shortening of muscle fibre; it persists after contraction has passed off.

**RELAXATION**—Condition of muscle fibres in the absence of contraction.

**POLARITY OF THE UTERUS**—When the body of uterus contracts, cervix dilates; when cervix is artificially dilated, body contracts. This correlation between the body and cervix is known as polarity of the uterus.

**LOWER UTERINE SEGMENT**—Part of the uterine body within 3" from the internal os. Its wall becomes stretched and thinned as labour advances. It does not contract or retract.

**UPPER UTERINE SEGMENT**—Comprises the rest of the body of uterus. Its wall becomes progressively thicker from retraction as labour advances.

Difference between upper and lower uterine segments.

- | Upper uterine segment.                                       | Lower uterine segment.  |
|--|---|
| 1. Active in labour.   | 1. Passive in labour.   |
| 2. Contracts and retracts, becomes thicker and shorter.      | 2. Dilates and becomes thinner and longer.                              |
| 3. Muscle, well marked and fibres running in all directions. | 3. Longitudinal lamellæ of muscle.                                      |
| 4. Membranes firmly attached.                                | 4. Membranes loosely attached.  |
| 5. Entirely covered by peritoneum.                           | 5. Peritoneal attachment is loose and partly absent in front and sides. |

**RETRACTION RING OR BANDL'S RING**—Is the junction of the upper and lower uterine segments. It is not apparent in normal cases, but may be felt through the abdominal wall in obstructed labour.

#### STAGES OF LABOUR.

First stage or stage of dilatation,

From the onset of labour pain till full dilatation of cervix.

Second stage or stage of expulsion,

From full dilatation of cervix until child is born.

Third stage,

From the birth of the child until the placenta and membranes are expelled.

#### FIRST STAGE.

Uterine contractions increase the general intrauterine pressure. It is transmitted through the liquor amnii in all directions, so that there is no direct propulsive force on the foetus, but it is exerted on the whole ovum.

It forces the bag of membranes into the cervix.

Contractions of the longitudinal fibres drag open the internal os.

Separation of chorion from decidua at the internal os, and the bag of membranes presents.

The upper pole of the foetus is pressed on by the fundus, while the lower pole is pressed down on to the lower uterine segment and cervix.

Full dilatation of cervix but very little descent of the foetus.

#### SECOND STAGE.

Membranes rupture.

Foetus is forced down by uterine contraction and retraction, and contraction of the abdominal muscles. The latter is voluntary in the early stages but later, it comes on automatically with each uterine contraction.

Uterine contractions act by,

1. Increase in the general intrauterine pressure as in the first stage. After rupture of membranes the head sinks into pelvis and acting like a ball valve, prevents the escape of liquor amnii, some of which is retained and is known as 'after waters'. If the whole of liquor amnii escape, general intrauterine pressure is absent.



- ii. Foetal axis pressure—The uterus contracts down on the foetus and the force is directly transmitted to the head through the body of the foetus. It is the main force which causes the expulsion of the foetus.
- The pelvic floor is stretched,  
It consists of two triangles
- i. Anterior
    - Base at symphysis pubis.
    - Apex at anterior fornix.
  - ii. Posterior
    - Base at the lower part of sacrum and coccyx.
    - Apex at perineum.
- The anterior triangle is pulled upwards and the posterior triangle pushed downwards and backwards, so that the pelvic floor opens out like a swing door and allows the child to be born.
- Expulsion of the child.

### THIRD STAGE.

Uterus becomes smaller and the placental site shrinks, causing detachment of placenta.  
Slight bleeding behind the placenta may help it.  
Uterus then treats the placenta as a foreign body and expels it.  
As the placenta is expelled it peels off the membranes and drags them behind it.  
Slight bleeding after separation of the placenta.

## CLINICAL COURSE OF LABOUR.

### Premonitory signs of labour.

1. Uterus sinks into the pelvis, so the patient is relieved of the difficulty in breathing caused by pressure on the diaphragm; this is known as *lightening*.
2. Frequency of micturition, due to pressure on the bladder.
3. False pains may be present.

Distinction between true and false pains :—

- | True pain.  | False pain.  |
|---|--|
| i. Felt in the lower part of back.                                      | i. Felt in abdomen.  |
| ii. Comes on at regular intervals and the uterus hardens during a pain. | ii. Comes on at irregular intervals and without any hardening of uterus. |
| iii. If membranes can be felt, they are tense during a pain.            | iii. Membranes are not tense during a pain.                              |
| iv. Caused by uterine contractions.                                     | iv. Caused by gastro-intestinal disturbance.                             |

**First stage**—Duration, primiparæ—12-15 hours. Multiparæ—7-10 hours.

## 1. PAIN.

Felt in the back.

They are involuntary, intermittent, and peristaltic.

Intervals between the pains allow the placental circulation to be re-established and give the mother a chance to recover from fatigue.

## 2. SHOW.

Discharge of mucus and blood

Caused by separation of the membranes.

Mucus is derived from expulsion of the plug in cervical canal and increased secretion of the glands.

## 3. SHORTENING AND DILATATION OF CERVIX.

More marked in primigravidae.

Uterine contractions push the bag of membranes down, force open the internal os and pull up the cervix, which becomes shorter and shorter until it merges with the lower uterine segment. In primiparae this is the sure sign that labour has started.

In multiparae, the external os will often admit the finger before labour has begun and the bag of membranes will project during a pain, which will indicate that labour has started.

First stage ends with rupture of the membranes and a gush of fluid.

Vomiting is not uncommon towards the end of first stage.

Pains during the first stage are involuntary until near the end; they are caused by uterine contractions and stretching of cervix.

**Premature rupture of the membranes.****CAUSES.**

1. Flat pelvis.
2. Malpresentation.
3. Hydramnios.
4. Obliquity of the uterus
5. Endometritis.
6. Adhesion between membranes and cervix.
7. Unnatural friability of the membranes.
8. Accidents.

**EFFECTS of early rupture of membranes,**

1. Prolonged labour.
2. Dilatation of os delayed.
3. Nipping of the anterior lip of cervix.
4. Dry labour and its consequences.
5. Pressure of the uterus on the foetus.
6. Injury to birth canal.
7. Uterine inertia.
8. Infection.

**DISADVANTAGES OF TOO LATE RUPTURE of the membranes.**

1. Onset of expulsive pains retarded.

2. Amnion may be pushed through the chorion, so that the latter may be partially retained.
- If the amniotic sac does not rupture at all,
1. Child may be born with caul i.e., with the membranes intact, and may die of suffocation if there is no attendant.
  2. Placenta may be dragged out with the amnion in the second stage of labour.
  3. Uterus may be inverted, if the placenta is not easily separated.

### **Second stage**—Duration, 2-4 hours.

Uterine contractions are stronger, more severe, of longer duration and with shorter intervals.

Voluntary contraction of the abdominal muscles with closure of the glottis—Bearing down.

Pelvic floor opens out like a swing door.

Vagina dilated and stretched.

Anus gapes open.

Head is pushed down and after having recoiled several times, remains fixed with the vault showing, at the end of a contraction—Crowning of the head.

Next pain usually expels the head which goes in a forward and downward direction. It goes forward because the uterine contractions push it downward and the pelvic floor upwards and forwards, so the resultant of the forces acts forwards.

As the head passes through vulva, the patient cries out, this acts as safety-valve action and protects the perineum, because the patient cannot bear down.

Further pain drives out the shoulder and body, followed by a gush of liquor amnii.

Causes of pain in the second stage.

- i. Uterine contractions.
- ii. Pressure on the sacral plexus causing cramps in the legs.
- iii. Stretching of vulva causes the most acute pain.

### **CAPUT SUCCEDANEUM.**

Oedematous swelling which develops on that part of the head which is free from pressure.

Caused by venous congestion and exudation of plasma.

Disappears in a few hours or days.

### **MOULDING.**

Alteration of the size and shape of the head due to pressure on the skull, which is reduced in certain diameters and increased in others.

Reduction in the size of head is brought about by,

- i. Squeezing out of blood and cerebrospinal fluid.
- ii. Overlapping of bones and obliteration of sutures. The frontal bones and the occipital pass under the parietals and the posterior parietal passes beneath the anterior.

### **Third stage.**

Duration, half to one hour.

Usually the pains subside for 10-15 minutes after expulsion of the child.

**TWO METHODS OF EXPULSION of placenta.**

1. **Schultze's method**—Retroplacental hæmorrhage occurs at the centre of the placenta and separates it from the uterus. The placenta then presents at the internal os by the foetal surface and so it is expelled with the foetal surface first.
2. **Mathews Duncan's method**—Separation starts at the margin and is caused by shrinkage of the placental site. The placenta is then folded upon itself and its lower margin presents at the internal os. It traverses the vagina and emerges from the vulva by one margin. Membranes may or may not be inverted.

There has been lot of discussion as to which is the commoner.

It is now believed that the placenta escapes from the uterus by Duncan's method and emerges from the vulva by Schultze's method.

After expulsion, the placenta drags the membranes after it.

There is usually a gush of few ounces of blood just after the placenta is expelled.

Average amount of blood lost in normal labour is from half to one pint; about 4 or 5 ounces before the birth of placenta and the rest with it.

**OBSTETRICAL DIAGNOSIS.****Definitions.**

**LIE**—Relation of the long axis of child to that of the mother. It may be longitudinal, oblique or transverse.

**PRESENTATION**—Foetal part which is lowest in the uterus, lying just above the internal os.

**POSITION**—Relation of a given part of foetus to the front or back of the mother.

**ATTITUDE**—Relation of the different parts of the child to one another.

**Abdominal examination.**

Patient lies on her back, abdomen uncovered and legs slightly drawn up.

Five distinct manipulations are employed in the systematic palpation of abdomen after the bladder and rectum have been emptied.

**FIRST OR FUNDAL GRIP.**

Examiner faces the patient's head.

Both hands are placed on top of the fundus, slightly to either side of the middle line; with depression and rotatory movements of the hands, foetal outlines are determined.

**Breech**—Rather irregular and soft.

**Head**—Hard round and smooth.

**SECOND OR UMBILICAL GRIP.**

Palpation by placing the hands on each side of the uterus about the level of the umbilicus.

A flat resisting mass, back, on one side and irregular prominences with very little resistance, the limbs, on the other side, may be felt.

**THIRD OR PAWLIK'S GRIP.**

Grasp the lower part of the abdomen by the thumb on one side and fingers on the other side (of the right hand) with the wrist pointing downwards just above the pubis.

Head will be found hard, round and smooth and the breech soft and irregular.

If the head is not fixed, it can be moved from side to side; any overlapping of the brim by the foetal head can be discovered.

**FOURTH GRIP.**

Examiner stands facing the patient's feet.

Palpate with the tips of the fingers passed deep down the sides of the pelvis and gradually sinking them into the brim.

The amount of flexion or extension of the head can be guessed by noting the level down to which the hands can be passed on either side. In full flexion the hand on the same side as the back will be at a lower level than the other, in full extension it will be at a higher level, and in incomplete flexion or extension both the hands would be at about the same level.

By this grip it is possible to estimate the relation of the head of the foetus to the size of the pelvic brim or by pressing down on the head, discover if it will descend or not. If it will not, try and estimate the degree of overlapping.

**FIFTH METHOD**—Standing on the left of the patient facing the feet; place the tips of the 3 middle fingers of the right hand on the symphysis pubis with the palmar surfaces against the abdomen. Any overlapping of the foetal head over the symphysis will be at once detected.

**AUSCULTATION.**

Position of the foetal heart is determined by auscultation, and in conjunction with other data found by abdominal examination helps towards the diagnosis of the position of foetus.

For this purpose De Lee's stethoscope, which can be fixed to the head is very useful, as it leaves the hands free to press the foetus against the anterior abdominal wall. It is also of great help during application of forceps as the foetal heart can be auscultated without soiling the hands.

The following can be ascertained by abdominal examination,

1. Lie and presentation.
2. Relative size of the presenting part and brim of pelvis.
3. Whether the presenting part has entered the pelvis or not.

4. Abnormalities *e.g.*, twins, hydramnios etc.
5. Some idea of the size of the child and whether it is alive or not.

### VAGINAL EXAMINATION.

Should be done with **aseptic** precautions if labour is expected in the next few weeks.

Patient lies on her back or on the left side.

The labia are separated by the fingers of the left hand and the index and middle fingers of the right hand are inserted into the vagina.

The following points are to be observed in vaginal examination.

1. Condition of vaginal walls and density of the perineum.
2. Condition of rectum and bladder.
3. Condition of cervix.
4. Condition of the membranes.
5. Presenting part.
6. If a limb or cord is prolapsed.
7. If there is any pelvic tumour or any other abnormality.
8. Size of the diagonal conjugate.

#### ESTIMATION OF THE DIAGONAL CONJUGATE.

Press the tip of the middle finger towards the promontory and bring the base of the fore finger in contact with the pubic arch.

Mark the point of contact of the fore finger and pubic arch with the index finger of the other hand.

Withdraw the fingers from the vagina and measure the distance between the tip of the middle finger and the point at the base of the fore finger as already marked, with callipers or tape measure. This gives the diagonal conjugate.

While doing these measurements, press the foetal head down as far as possible into the pelvic brim with your left hand on the abdomen and estimate how much of the foetal skull descends into the pelvis. This is Munro Kerr's manœuvre. (*Vide*, fig. 1).

9. Estimate the size of the sub-pubic angle and transverse diameter of the outlet.
10. Do Fitzgibbon's manœuvre, if there is any question or doubt as to the possibility of the foetal head overlapping the brim. Grasp the symphysis between finger and thumb (*vide*, figs. 2, 3) and see what degree of overlapping there is when the other hand presses down the head.

## CHAPTER II.

### HEAD PRESENTATION.

#### THREE VARIETIES.

1. Vertex—Commonest, 96 per cent. of all cases of labour.

##### Causes,

- (a) As the head is heavier, it goes down.
- (b) Fœtal ovoid is better accommodated in uterus in this position.
- (c) In 80 per cent. of normal primiparæ the head is fixed 15-20 days before the due date for confinement. In 20 per cent. the head descends at the onset of labour. In multiparæ the head as a rule descends 2 or 3 days before full term.

2. Face—1 in 300.

3. Brow—Rarest, 1 in 1,500.

#### VERTEX PRESENTATION—Four positions.

1. Left occipito-anterior (L.O.A.)—First position.
2. Right occipito-anterior (R.O.A.)—Second position.
3. Right occipito-posterior (R.O.P.)—Third position.
4. Left occipito-posterior (L.O.P.)—Fourth position.

#### DIAGNOSIS OF L.O.A.

##### ABDOMINALLY.

Breech at fundus.

Back to the left and in front.

Limbs on the right.

Head in the pelvis.

Groove of the neck is oblique and lowest on the same side as fœtal back *i.e.*, the hand can be passed lower down on this side.

Fœtal heart, just below and to the left of the umbilicus.

##### VAGINALLY.

Sagittal suture in the right oblique diameter.

Posterior fontanelle in front and to the left.

Anterior fontanelle high up behind, and to the right.

**SECOND POSITION OR R.O.A.**—Read the above with right substituted for left and *vice versa*.

#### THIRD POSITION, R.O.P.

##### ABDOMINALLY.

Breech at fundus.

Limbs in front and to the left.

Back is behind and to the right.

Head at the brim, usually higher up, with the most prominent part to the left of the symphysis. There is a

hollow felt half way between the symphysis and the umbilicus due to concavity of the foetus and absence of the prominent left shoulder.

Foetal heart below and to the right of umbilicus.

#### VAGINALLY.

Sagittal suture in right oblique diameter.

Posterior fontanelle behind and to the right.

Anterior fontanelle in front and to the left.

#### FOURTH POSITION, L.O.P.

Read the above with left substituted for right and *vice versa*.

Frequency—First position commonest, 60 per cent. of all cases of labour.

#### Causes,

1. Shoulder has a tendency to lie in the right anterior quadrant of the pelvis due to the action of gravity.
2. The antero-posterior diameter of the foetus tends to correspond to the right oblique diameter owing to the normal torsion of uterus to the right.
3. As there is more space available in the right oblique diameter due to the presence of rectum on the left, the antero-posterior diameter of the foetal head is better accommodated in the right oblique diameter.
4. The transverse diameter of inlet is not favourable for the head to engage, due to,
  - (i) Bulging forward of the promontory.
  - (ii) Encroachment by the Psoas muscles on either side.

### MECHANISM OF NORMAL LABOUR.

(L. O. A.)

#### SEQUENCE OF MOVEMENTS.

Engagement.

Descent—Occurring all the time.

Flexion.

Internal rotation.

Extension.

Restitution.

External rotation.

Expulsion.

#### ENGAGEMENT.

Presenting part enters the superior strait.

Head becomes fixed, cannot be moved from side to side and is fixed.

It occurs towards the end of pregnancy in primiparae, and just before labour starts, in multiparae.

DESCENT—Occurring throughout labour, chiefly in the second stage.



**CAUSES.**

1. Uterine contractions producing,
  - (i) Increased intrauterine fluid pressure.
  - (ii) Foetal axis pressure.
2. Contractions of diaphragm and abdominal muscles.
3. Unfolding of foetus with progress of labour.

**FLEXION**—With descent, head becomes more and more flexed until chin comes in contact with chest. In complete flexion, posterior fontanelle is at lower level than the anterior.

**CAUSES.**

1. Shape of head (wedge theory). The occiput is much steeper than the sinciput, so the former descends with less friction and more easily.
2. Cylinder theory. When an ovoid is pushed through a cylinder, its long axis tends to adapt to the long axis of the cylinder; so the mento-vertical diameter of head tends to occupy the long axis of the pelvic canal and the subocciputo-bregmatic diameter lies across the canal.
3. Lever theory. The occipito-spinal joint is nearer the occiput than the forehead, so a force acting at this point will push the occipital end lower than the forehead.
4. Couple of forces theory. If some amount of flexion is present at the beginning, the gridle of contact will act at a greater mechanical advantage over the forehead and so approximate the chin and sternum.

**INTERNAL ROTATION**—Occiput rotates from the anterior end of right oblique diameter to under the pubic arch, rotating through  $\frac{1}{2}$  of a circle.

**CAUSE.**

1. The pelvic floor is a sloping gutter formed by two halves of the Levator ani muscle leading to a free space in front, behind the pubic arch. The presenting part rotates away from the resistance to the free space in front.
2. The greatest diameter at outlet is the antero-posterior one; so the shape of the bony pelvis directs the occiput forwards (by a rifling action). This theory fails to explain why in certain cases the occiput rotates backwards.

**EXTENSION**—When the occiput is free behind the pubic arch, head extends and the vertex, forehead, face, and chin pass over the edge of perineum in succession.

**CAUSE**—The uterus and abdominal muscles are pushing the head downwards, while the muscles constituting the pelvic floor are pushing it upwards and forwards. The downward and upward forces neutralise each other, so the head moves forwards and this is possible only by extension.

**RESTITUTION**—As soon as head is born, the occiput rotates through  $1/8$  of a circle, towards the mother's left, to undo the twist of the neck produced by internal rotation.

**EXTERNAL ROTATION**—As the shoulders descend, the right and anterior one being the lower, meets the resistance of the pelvic floor first and so rotates to the free space in front; consequently the shoulders occupy the antero-posterior diameter of outlet. As the shoulders rotate, head also rotates with them through another  $1/8$  of a circle towards the mother's left thigh.\*

**EXPULSION**—Anterior shoulder is pressed below the pubic arch, the posterior one then passes over the anterior edge of perineum and is born; then the anterior shoulder and trunk are born passing under the symphysis pubis.

For second vertex position, R.O.A., read right for left and *vice versa*.

## MECHANISM OF OCCIPITO-POSTERIOR POSITION.

There are two different ways in which the head may be born in these cases,

- I. When the head is fully flexed.
- II. When the head is incompletely flexed.

### I. Mechanism in fully flexed head.

Occiput meets the resistance of the pelvic floor, rotates forwards through  $3/8$  of a circle and reaches beneath the pubic arch. The shoulders rotate only  $2/8$  of a circle from one oblique diameter to the other. Therefore when the head is born, restitution carries the occiput through  $1/8$  of a circle towards the same side which it was occupying in the pelvis. As the anterior shoulder goes to the front, head rotates through another  $1/8$  of a circle and then the shoulders and body are born as in occipito-anterior position.

### II. Mechanism in incompletely flexed head.

#### CAUSE OF INCOMPLETE FLEXION.

1. In posterior positions the convexity of foetal spine comes against the convexity of maternal spine, so there is a tendency for the foetal spine and head to be extended to fit the maternal spine better. This is more pronounced if the maternal abdominal muscles are tight, as in primigravidae.
2. In posterior position the bi-parietal diameter lies in a small diameter encroached by sacral promontory. So the anterior part of the head descends more readily than the posterior, and therefore the head enters the pelvis incompletely flexed.

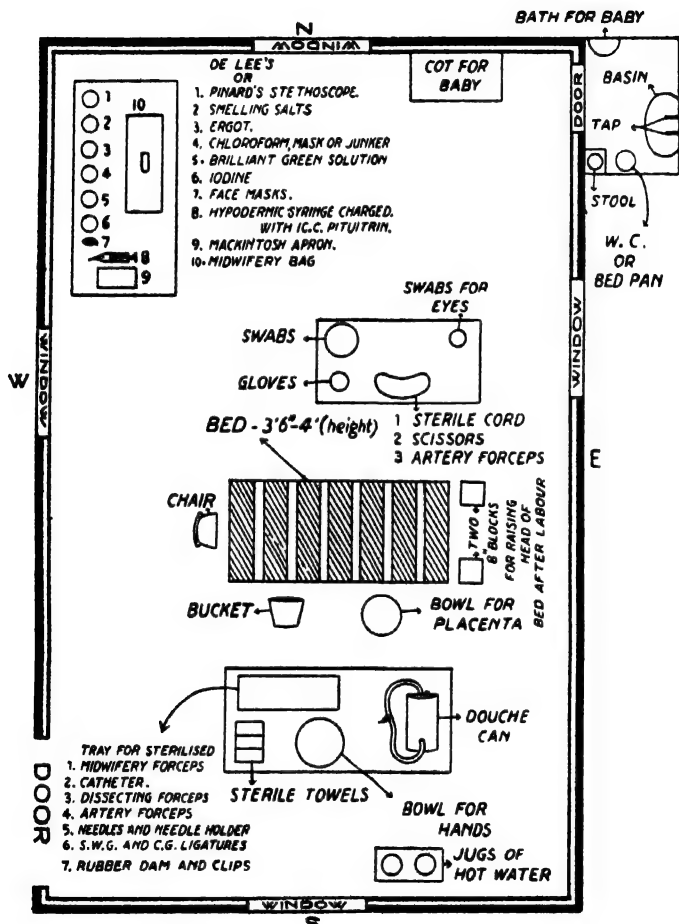


Diagram showing arrangements of a Labour-Room in the Tropics.

difficult vertex presentation. This mechanic of squatting favours flexion and descent and has been used since time immemorial. We have several times known it to succeed in difficult posterior positions. It is this position which is referred to in the Books of Genesis and Job

### MANAGEMENT OF NORMAL LABOUR.

Whenever called to a case of labour, attend as soon as possible. The first principle in management is prevention of sepsis.

**ROOM**—Good size, well ventilated and well lighted and no unnecessary furniture.

**BED.**

Single bed.

If it sags in the middle, put a fracture board or leaf of a table under the mattress.

Two mackintosh sheets, one over the mattress and the other over the sheet covered by a draw sheet.

**DRESS**—Loose and light.

### ARTICLES WHICH SHOULD BE GOT READY.

#### A. INSTRUMENTS.

1. Higginson's syringe.
2. A douche can with two nozzles.
3. A soft rubber catheter, a female catheter and a mucus catheter.
4. Scissors, six artery forceps, catgut, silk worm gut and needles.
5. Steriliser, nail brush and two pairs of rubber gloves.
6. Chloroform inhaler, stethoscope, pelvimeter and Clover's crutch.
8. Outfit for subcutaneous and intravenous saline.
9. Hypodermic syringe.

#### B. DRUGS—Biniodide of mercury tablets, ergot, pituitrin, sodium chloride tablets, morphine and scopolamine.

The patient should keep ready two wash hand basins for washing hands and five other enamel basins for antiseptic solution, rubber gloves, placenta and soiled swabs, lotion for the baby's eyes, one small table and two jugs filled with boiled water.

Strict aseptic precautions must be observed. Owing to the prevalence of puerperal sepsis in the tropics, we should like to utter a note of warning here.

Every case of labour should be regarded as a major surgical operation and as such the rules of asepsis should be meticulously observed by the attending physician, nurse and other attendants. It is very important then, that they should wear masks, overalls and gloves while conducting a labour case. Recently it has been indisputably shown that many epidemic cases of puerperal sepsis were due to nurses, doctors or other attendants on labour cases

being carriers of streptococci in their throats or noses which were conveyed by droplet infection to a lacerated cervix or vagina. Such an occasion can be prevented by wearing masks.

1. Patient should be given a bath, pubic hairs clipped short or preferably shaved and painted with tincture of iodine, flavine, mercurochrome or brilliant green. We prefer the latter.
2. Hands must be thoroughly washed and disinfected for any internal examination.
3. Vaginal examination.  
No unnecessary examination.  
Always wear gloves and clean the vulva.
4. Evacuate bowels and bladder when the pain starts.
5. Repeated swabbing of vulva and perineum in the second stage. Swab the vulva from before backwards and use each swab once only.

#### EXAMINATION OF THE PATIENT.

**ABDOMINAL EXAMINATION**—Determine presentation, position, and whether the presenting part has entered the pelvis or not.

**VAGINAL EXAMINATION**—To find out,

1. If labour has started.
2. Capacity of the pelvic cavity and outlet.
3. If the head is fixed.
4. Degree of dilatation of cervix.
5. Condition of the membranes.
6. If any abnormality is present.

#### PREMONITORY STAGE.

If the bowels are not properly opened—Castor oil one ounce followed by a soap and water enema.

#### First stage.

Assure the patient that everything is all right.

Let her walk about; she may rest on a chair or sofa when feeling tired. The weight of foetus and liquor amnii stimulates uterine contractions and helps dilatation of os.

No bearing down—It only exhausts the patient.

Encourage her to pass water, or pass catheter if bladder not properly emptied.

Light nutritive drinks.

We give 1/100 gr. of scopolamine every ½ hour for 3 doses and then 1/200 gr. every two hours upto 6 or 7 injections with a view to lessing pain and begetting amnesia. Only occasionally is the patient boisterous, needing restraint. The labour is accelerated and there are no dangers to mother and baby in our experience. Chloroform is only necessary at crowning stage. We never inject morphia.

#### Second stage.

Patient should lie in bed—Left lateral or dorsal position.

Asked to bear down with pains. She may pull on a towel fixed at the foot end of the bed.

If the bladder is distended—Pass catheter.

**Anæsthesia**—We advocate light chloroform anæsthesia which is deepened as the head begins to distend the vulva, using Junker's apparatus. Clip a rubber dam over and above the anus.

### PREVENT RUPTURE OF PERINEUM.

1. Don't let the head be born too quickly.

Anæsthesia helps. We usually iron the vaginal outlet to relax the perineal muscles.

When the head appears at vulva, remove the towel and ask the patient not to bear down but cry out as a pain comes.

2. Keep the head flexed until the occiput is free of symphysis pubis so that the vulva is distended by the suboccipito-bregmatic diameter ( $3\frac{3}{4}$ " ) instead of occipito-frontal diameter ( $4\frac{1}{4}$ " ).
3. Don't let the head be born at the height of a contraction. Try to express the head between the pains. The thumb and fingers on each side of the posterior portion of vulval outlet should prevent too rapid expulsion of the head. If the head is pressed forwards too forcibly, urethra and vulva may be bruised.

### EPISIOTOMY.

Making two lateral incisions on either side of the middle line.

Sometimes only one incision may be made.

Done in exceptional cases only, when there is risk of a big tear of perineum.

Advantages,

1. Soft parts are not stretched.
2. No laceration.
3. Clean wound and so heals better after suturing.
4. Fœtal head is not subjected to undue pressure.

As soon as the eyes are born, clean them by swabbing with in 5000 perchloride of mercury solution. A drop of 1-2 per cent. silver nitrate solution may be instilled into the eyes.

This must be done if the mother is suffering from gonorrhœa.

Clean the mucus from the child's mouth.

Pass a finger and feel if the cord is coiled round the neck.

If so, try to slip it over the head; failing that slip it over the shoulder. If this cannot be done clamp the cord with two artery forceps and cut between them.

Place the left hand over the abdomen covered with sterile towel and follow the uterus down as the rest of the child is born. Direct the child's body as far forwards as possible with the right hand.

In case of delay, delivery may be assisted by

- (1) Fundal pressure—Danger, rupture of perineum.
- (2) Traction on the axilla—Danger, may fracture clavicle.
- (3) Traction by the head—Danger, may injure cervical plexus or Sternomastoid muscle.

The best is to combine the three, when very little force is needed and the above risks are avoided.

**Method**—Tip of the index finger is passed through the anterior axilla and traction is made by the middle section of the finger. The head is pulled by the other hand, while the nurse presses the fundus downwards and backwards.

Wipe the mouth and nostrils.

Smack lightly on the buttocks, if the child does not cry vigorously.

Tie the cord 2" from the umbilicus with a reef knot, when

i. The child has cried vigorously.

ii. Pulsation has ceased in the umbilical artery except in the last few inches.

iii. Umbilical vein has collapsed.

Otherwise child is deprived of 2—3 ounces of blood, which is equivalent to 1—1½ pints of blood in the adult.

Cut the cord with sterile scissors and paint the cut end with iodine.

A second ligature is not necessary, but when applied it has the following advantages,

i. It helps diagnosis of the separation of placenta.

ii. Prevents the slight bleeding from placental end which may soil the linen.

iii. Prevents any bleeding from the placental end of the second child in case of twins.

Cut the cord and separate the child.

Wrap the child in flannel and place it on one side (preferably the left, as it is supposed to favour the closure of foramen ovale)—Facilitates escape of mucus.

Examine the posterior vaginal wall and perineum by separating the labia widely in good light, with the patient on her back.

Suture any tear or laceration. They may be left untied, (clipped with artery forceps) until the placenta is born.

### **Management of the third stage.**

**PATIENT LIES ON HER BACK**, advantages,

i. Allows easier manipulation and better control of the uterus.

ii. Blood is less likely to collect in uterus as it comes out by the action of gravity

iii. Less chance of air embolism.

Place the left hand lightly on the fundus, ulnar border being sunk into the abdomen and the fundus lying in the hollow of the hand. Bleeding from the uterus will be detected by seeing the blood if it comes out, or if it is retained, by increase in the size of the fundus under the left hand.

No active interference if there is no undue bleeding, until the placenta is separated.

### **SIGNS OF SEPARATION OF PLACENTA.**

1. The length of cord outside the vulva increases. This is

easier to detect if a second knot had been tied at a definite distance from the vulva.

2. Uterus rises up.
3. Uterus feels globular, smaller, harder and more movable.
4. Slight bleeding.
5. Traction on uterus fails to draw up the cord.
6. Slight pain.

**EXPULSION OF PLACENTA**—If the uterus is not contracting, stimulate it with the fingers of the left hand and then press it downwards and backwards when it is contracting. This pushes the separated placenta outside the vagina, and it is received in the right hand.

**NOTE**—Some clinics make a distinction between expression and expulsion of placenta. They hold that in the former the uterus is squeezed as one would squeeze an orange pip, and expulsion for the manoeuvre described above. Others use the term expression for what has been described as expulsion above.

After expulsion keep the hand quietly on the uterus for half an hour or until the uterus contracts and retracts regularly.

#### EXAMINATION OF PLACENTA AND MEMBRANES.

Placenta is received in the right hand as it is expelled.

It is generally inverted during birth, and therefore amnion is on the outer side.

Push the placenta out through the hole in the membranes so that the maternal surface can be examined.

Wash the placenta gently under a tap to remove blood clots.

Place the placenta on the palm of both hands and note,

- i. If any cotyledon is missing.
- ii. If the membranes have been expelled entire.

Separate amnion from chorion and examine them separately,

If a part of chorion is found missing—Ascertain if it is simply torn or part of it has been torn off and retained in the uterus. Note if there are two torn blood vessels at the margin of the hole—This denotes that a succenturiate placenta is retained and will require manual removal.

**IF A COTYLEDON IS RETAINED**—It must be removed.

#### RETENTION OF A PIECE OF CHORION,

If it is small—It will be discharged with lochia.

If large,

- (a) hanging into vagina—Try to remove it with fingers or with artery forceps.
- (b) entirely inside the uterus—Leave it alone.

Examine the vulva and perineum for tears, and if present, it must be stitched.

**Perineal toilet**—Perineum washed, dried, covered with sterile pad.

Apply abdominal binder.

Administration of ergot by mouth or hypodermically is recommended by some.



Don't leave the patient for at least one hour; make sure that everything is all right before leaving the patient,

Pulse rate 100 or less.

Uterus well retracted.

Baby—Breathing well.

No abnormality.

No bleeding from the cord.

## **OCCIPITO-POSTERIOR PRESENTATION WITH INCOMPLETE FLEXION.**

### **Diagnosis.**

Abdominally,

Abdomen appears flat.

Head is slightly higher than in occipito-anterior cases.

Limbs are very prominent.

It may not be possible to feel the back.

Heart sounds are better heard towards the flanks.

Vaginally,

Anterior fontanelle is lower and can be easily felt.

Free border of the ear points towards the occiput.

### **Prognosis.**

MOTHER,

i. Longer labour.

ii. More liable to infection owing to internal manipulations.

iii. Tear of perineum and injury to the soft parts in unreduced cases.

iv. Head may become impacted.

CHILD,

i. Risks to the child are greater than in anterior cases.

ii. Injury of the head, if forceps used.

### **Treatment.**

Only in 2 per cent. of all vertex cases, occiput remains posterior throughout the labour.

**BEFORE LABOUR** or just when labour starts, fixing two pads with a binder as recommended by Buist may help rotation of the back forward. The head must be free above the brim for this treatment to be effective. Place the binder under the patient. One towel is rolled and fixed to the binder so that when it is drawn tight the rolled towel pushes the back of the foetus forwards; another towel is folded 6" square and 1" thick and pinned to the binder so that it presses the limbs backwards when the binder is drawn tight.

**FIRST STAGE**—Don't interfere unless the mother is about to get exhausted or the child is in distress. In these cases the head should be manually rotated after cervix is three fingers dilated, an assistant rotating the shoulder towards the middle line abdominally.

**SECOND STAGE.**

If the anterior fontanelle can alone be felt on vaginal examination, interference is almost always required.

Don't interfere until the natural forces have been given ample opportunity. This will help any manipulation that may be required later.

Attempts to flex the head are nearly always unsuccessful.

When in spite of good pains the head is not making any progress or the occiput has rotated into the hollow of the sacrum—Rotate the head with the hand in the vagina grasping the head between two fingers and thumb and bring the occiput to the front; an assistant manipulating the shoulder per abdomen, pushes the anterior one forwards towards the anterior end of the opposite oblique diameter at the same time.

If successful—Apply a tight binder and leave it to Nature.

If rotation is difficult—Pass two fingers behind the anterior shoulder and force it forwards; then grasp the head and rotate the occiput forwards, an assistant pushing the shoulder forwards at the same time.

If the head has a tendency to go back—Apply forceps immediately after rotation. The forceps should preferably be applied according to the position of the occiput *i.e.*, in R.O.P. after manual rotation, right blade is applied first and held in position by an assistant and then the left blade is applied.

Failing this—Rotation by forceps may be tried.

Dangers—Injury to the soft parts of the mother and head of the child, and so objected to by some authorities.

Alternative treatment—Internal version and deliver as a breech.

Some authorities recommend the following treatment,

Apply forceps with antero-posterior grip.

Pull the head low down into the pelvis.

Remove the forceps.

Rotate the head manually until the occiput is in front.

Re-apply forceps and deliver.

**INDICATIONS FOR PERFORATION,**

i. Head is impacted and cannot be rotated and the child is dead.

ii. Mother's condition is very bad or child's heart rate is below 110 or over 160.

Perineum is likely to be torn badly and must be sewn properly, muscle to muscle, fascia to fascia, and mucous membrane to mucous membrane.

Episiotomy may be done.

**NOTE**—The occipito-posterior position is the commonest cause of *Failed Forceps* in India as in other countries, patient oftentimes coming to hospital after several attempts at delivery have failed and many examinations. We are of opinion that when conditions are suitable and the foetus is

alive it is safer and better to perform lower uterine segment Cæsarean section in these cases than do craniotomy; for maternal mortality of a Cæsarean with a live child is less than that of craniotomy in the tropics. *Failed Forceps* occur most often in private practice due to antenatal neglect and prejudice and cause death of the mother in 2 per cent. cases or enormous laceration of the genital canal which will need expert treatment later.

## SECTION V—ABNORMAL LABOUR.

### CHAPTER I.

#### ABNORMAL PRESENTATIONS.

**Any presentation other than vertex.**

##### **Causes.**

Anything which interferes with the easy engagement of head in the pelvic inlet.

##### **I. MATERNAL,**

###### **A. ABDOMEN.**

(i) Lax abdominal wall, pendulous belly.

(ii) Tumour in abdomen

###### **B. PELVIS.**

(i) Contraction.

(ii) Tumour, bony or soft.

###### **C. UTERUS.**

(i) Obliquity.

(ii) Tumour.

(iii) Placenta prævia.

##### **II. FŒTAL,**

1. Hydramnios.

2. Hydrocephalus.

3. Twins.

4. Premature or dead child.

5. Monsters.

6. Very small or very large child.

7. Short cord.

#### FACE PRESENTATION.

In this condition the head is completely extended so that occiput is pressed against the back.

Frequency, 1 in 250. More common in multiparæ.

##### **Causes.**

**I. PRIMARY FACE PRESENTATION**—When the face presents before labour starts. Generally caused by congenital malformations *e.g.*, anencephaly, tumours of neck, spastic condition of the neck.

**II. SECONDARY FACE PRESENTATION**—Caused by difficulty in the entrance of head into pelvis.

1. Contracted pelvis.

2. Large size of head.

3. Occipito-posterior position, specially when associated with slight pelvic contraction. The incomplete flexion gradually changes into complete extension.

4. When the foetus lies with its back towards the right, the uterine force (due to the normal obliquity of uterus to the right) pushes the occipito-spinal joint in the direction of the face and causes extension. The same thing happens in pendulous belly when the foetus lies with its back to the front.
5. Dolico-cephalic head—Occipito-frontal diameter is unusually long, so the projecting occipital end offers greater resistance and the head becomes extended. In the normal moulding of head in face presentation, this diameter is increased, so it is more likely that the shape of the head is an effect rather a cause of face presentation.
6. Short cord—May cause extension of back and thereby produce extension of head.

### Positions.

Chin is the denominator in face presentation.

The positions are numbered according to the positions of vertex from which face presentations would secondarily arise, *e.g.*, First vertex (L.O.A.) when converted into face becomes first face, (R.M.P.) right mento-posterior.

### FOUR POSITIONS.

FIRST, right mento-posterior (R.M.P.), chin is directed to the right and behind.

SECOND, left mento-posterior (L.M.P.), chin directed to the left and behind.

THIRD, left mento-anterior (L.M.A.), chin directed to the left and in front.

FOURTH, right mento-anterior (R.M.A.), chin directed to the right and in front.

First position is commonest.

Third and fourth positions are relatively more frequent than in vertex, due to the cases of incomplete flexion in occipito-posterior positions being changed into complete extension by the forces of labour.

### Diagnosis.

#### ABDOMINAL EXAMINATION.

1. Longitudinal lie of the child, head at the pelvic brim, usually higher than in vertex cases, and breech at fundus.
2. Upper part of the child's back cannot be so easily felt as in vertex cases.
3. Part of the back above the (mother's) umbilicus is very prominent.
4. Prominence of the head is on the same side as the back and a deep sulcus between the head and back.
5. The groove of the neck is higher on the same side as the back of the child, *i.e.*, the hand on the same side as the chin can be pushed further down than the hand on the side of the back.

6. Foetal heart sounds are heard very distinctly among the limbs in dorso-posterior cases.

#### VAGINAL EXAMINATION.

1. Face is usually high up and it may be difficult to reach.
2. Bag of membranes is elongated, as the face does not fill up the lower uterine segment.

After rupture of membranes—Mouth, nostrils, chin and ear may be felt. Be careful not to injure the eyes when feeling for the orbital cavities.

Differential diagnosis—Face and breech presentation  
*Vide*, p. 136.

#### Mechanism of labour.

Extension.

Internal rotation.

Flexion.

Restitution.

External rotation.

ENGAGING DIAMETER—Submento-bregmatic in full extension and submento-vertical in incomplete extension.

#### MENTO-ANTERIOR POSITIONS.

Chin meets the resistance of the pelvic floor and therefore rotates forwards and lies below the pubic arch.

The forces of labour and the pelvic resistance pushes the head forwards and it is born by a movement of flexion, forehead first, followed by vertex and occiput.

Restitution—Face turns to the original side, and the twist in the neck is undone.

External rotation—Produced by the internal rotation of the shoulders in the same way as in vertex cases.

#### MENTO-POSTERIOR POSITIONS.

- i. HEAD COMPLETELY EXTENDED—Chin moves through  $\frac{3}{8}$ th of a circle and the mechanism is the same as in occipito-posterior position with complete flexion.

- ii. HEAD INCOMPLETELY EXTENDED.

If the chin is not lower than the forehead its forward rotation may not occur and a persistent mento-posterior position results; it is a more serious condition than persistent occipito-posterior presentation.

When chin rotates into the hollow of sacrum, vertex lies against the symphysis pubis and the neck and shoulder are in the brim. As the head cannot pivot round the symphysis, further progress is impossible. The head, neck and shoulder are so jammed that further advance is arrested. If the child is dead or very small, chin may slip over the perineum and head may be born by flexion.

The diameter distending the vulva is the same as in mento-anterior cases.

**Prognosis.**

Face presentation by itself is not more serious than vertex in the absence of other complications.

**Difficulties.**

1. Membranes are more liable to rupture early as the face does not completely fill the lower uterine cavity.
2. Labour usually prolonged—Face being a blunter and less efficient dilator.
3. Diameter presented is one nearer the submento-vertical ( $4\frac{1}{2}$ " ), and therefore is slightly larger than in vertex presentation.
4. Uterine forces are applied more tangentially to the head and therefore lose a certain amount of efficiency.
5. Face cannot mould as vertex.
6. Persistent mento-posterior cases are more difficult, require more interference and therefore more liable to infection.
7. Perineal laceration due to,
  - i. Large circumference of the head passing through the vulva.
  - ii. Greater downward protrusion of the pelvic floor, as the presenting part must descend very low before flexion can occur.

**Moulding.**

Submento-vertical diameter compressed.

Bulging of the occipital end and to a lesser extent of the frontal end of head.

Occipito-frontal diameter increased.

**Management.**

1. Find out the cause, and if any other abnormality is present, and treat accordingly.
2. If seen early—Conversion into vertex may be tried;
 

Drawbacks,

  - i. Rarely successful.
  - ii. May produce brow presentation.

**METHODS OF CONVERSION INTO VERTEX.**

- (a) Schatz's or external method,

Anæsthetic. Trendelenberg position.

Grasp the anterior shoulder with one hand and the back below the breech with the other.

Lift the foetus up towards the fundus.

Press the anterior shoulder towards the back of the foetus, and the breech in the opposite direction by the other hand.

Finally push the child down and apply binder.

- (b) Thorn's or Baudeloque's method—Os must be two fingers dilated.

Anæsthetic. Dorsal position.

Introduce the hand corresponding to the same side as the chin into, vagina.

Push the chin of the foetus upwards with two fingers in the uterus, and then the upper jaw and lower jaw successively.

An assistant presses the shoulder in the direction of child's back and breech in the opposite direction as in Schatz's method.

**FIRST STAGE**—Keep the patient in bed. Prevent early rupture of membranes.

## SECOND STAGE.

If the presenting part is still high up when os is fully dilated—Pass a hand up and try to flex the head.

If the face is low down in pelvis,

i. Try to keep the chin lowest—Keep the patient lying on the side opposite to that of the chin.

ii. If labour is delayed—Pull the chin down and direct it forwards, and apply forceps if necessary.

If the head remains high and dilatation is complete—Internal version, particularly if any complication is present *e.g.*, prolapsed cord. We have performed Caesarean section for this condition rather than risk a dead baby.

## PERSISTENT MENTO-POSTERIOR POSITION.

**NOTE**—The chin rotates when it is very low down. It generally bulges on the perineum before rotation actually occurs.

Interference is indicated only when it is apparent that the normal mechanism has failed or the condition of mother or child demands it.

Chin in sacral hollow,

i. Major degree of pelvic contraction and there is reasonable chance of getting a living child—Caesarean section.

ii. No pelvic contraction or very slight—Manual rotation and forceps.

iii. Failing forceps—Perforation. Perforate through the orbit; it is rather difficult to perforate through the mouth.

## BROW PRESENTATION.

In brow presentation, the head is midway between extension and flexion.

### CAUSES.

Contracted pelvis.

All the causes of secondary face presentation.

**POSITION**—Forehead is the denominator.

### MECHANISM.

Ordinarily there is no proper mechanism.

If the child and pelvis are normal, delivery is impossible.

With premature child or very roomy pelvis, head may be born naturally.

Frontal region undergoes internal rotation and comes under the pubic arch, the face is flattened against symphysis pubis and the occiput occupies the sacral hollow. Forehead is



born and is followed by vertex and occiput, and then the face slips from behind the symphysis pubis. Restitution and external rotation occur in the same way as in face presentation.

In fronto-posterior cases, delivery is more difficult.

Extreme moulding occurs—Vertico-mental diameter is shortened and occipito-frontal, lengthened.

#### DIAGNOSIS.

Abdominally is difficult.

The most prominent part of the head is on the same side as the back but the chin prevents the head being pushed down into the pelvis.

The grooves on either side of neck are at the same level.

Vaginally—The fingers strike the frontal bones and middle of the frontal suture.

#### PROGNOSIS.

Natural delivery is practically impossible and should not be expected.

Sepsis and injury to mother.

**TREATMENT**—If any cause for the malpresentation is apparent, treat accordingly.

1. Head not engaged,

(a) Before rupture of membranes,

Rectification—Impossible in 20 per cent. cases.

Bipolar version—Better, and bring down a leg.

(b) After rupture of membranes,

Internal version after manual dilatation, if necessary.

2. After engagement of head,

Convert to vertex or face presentation; former better, latter easier.

Don't change into face, if the chin cannot be brought to the front.

Failing conversion,

Head high up—If conditions of mother and child are good and surroundings favourable, Cæsarean section.

Otherwise, perforation.

Head in cavity—Leave to nature as long as the conditions permit, and then apply forceps, if suitable; otherwise, perforation.

Child dead—Perforation.

#### BREECH PRESENTATION.

The foetus lies longitudinally with its pelvic pole downwards.

**FREQUENCY**—5 per cent.

**COMPLETE BREECH**—Child lies with the legs and thighs flexed so the feet are near the buttocks.

**INCOMPLETE BREECH**—When any part of the lower limbs are extended.

(a) Both legs extended, feet lying near the shoulders—Frank breech.

(b) Knee presentation—When the knees present.

(c) Footling presentation—When the feet present.

**CAUSE.**

Same as for other malpresentations.

Conditions which specially favour breech presentation.

i. Prematurity—As the head is comparatively larger.

ii. Hydrocephalus.

iii. Second of twins.

**POSITIONS.**

**FIRST.**

Sacrum (back) to the left and in front.

Left sacro-anterior, L.S.A.

Bisiliac diameter occupies left oblique diameter.

**SECOND.**

Sacrum to the right and in front.

Right sacro-anterior, R.S.A.

Bisiliac diameter occupying right oblique diameter.

**THIRD.**

Sacrum to the right and behind.

Right sacro-posterior, R.S.P.

Bisiliac diameter occupying left oblique diameter.

**FOURTH.**

Sacrum to the left and behind.

Left sacro-posterior, L.S.P.

Bisiliac diameter occupying right oblique diameter.

First position is commonest.

**Diagnosis.**

**ABDOMINALLY,**

Fundus of the uterus is narrower and lower part broader than in vertex presentation.

Hard, round and smooth head, which can be moved from side to side, at the fundus.

Presenting part comparatively higher.

Soft breech felt at the lower pole.

Foetal heart sounds will be heard at a higher level than in vertex, as the breech usually sits on the pelvic brim. When the legs are extended, foetal heart sounds will be heard slightly lower down, as the breech then sinks into the cavity.

**VAGINALLY,**

Presenting part high up.

Bag of membranes elongated and sausage shaped.

Rounded buttocks, prominence of sacrum, sometimes a foot or both feet or the scrotum, may be felt.

After rupture of the membranes, one may feel,

Anus.

Genital organs. Folds of groin.

Three bony points, two ischial tuberosities and the tip of coccyx.

**Differential Diagnosis (Berkeley).****I. BREECH AND FACE.****FACE.**

1. Breech at the fundus.
2. Orbital ridges.
3. Eyes.
4. Nose and nostrils.
5. Chin.
6. Malar bones.
7. No corresponding part.
8. Mouth.
9. Tongue.
10. Finger in the mouth sucked.
11. Nil.

**BREECH.**

1. Head at the fundus.
2. No corresponding part.
3. Nil.
4. Nil.
5. Nil.
6. Ischial tuberosities.
7. Genital organs.
8. Anus, no gums.
9. Nil.
10. Finger gripped by the sphincter.
11. Meconium on the finger.

**II. SHOULDER,**

1. Axilla may be defined.
2. Presence of ribs.

**III. SACRUM** felt through a small os may be mistaken for head, but there is no suture, fontanelle or hair.

**IV. FOOT AND HAND.****FOOT.**

1. Long and narrow.
2. At right angles to leg.
3. Heel with malleolus above.
4. One edge thicker than the other.
5. Toes in one straight line.
6. Great toe in a line with the others and not freely movable.
7. Nil.

**HAND.**

1. Short and broad.
2. In the same line as arm.
3. No corresponding part.
4. Both edges of the same thickness.
5. Fingers of different length.
6. Thumb movable.
7. Hand may grip the finger.

**V. KNEE AND ELBOW.****KNEE.**

1. Broader.
2. Patella.
3. Two tuberosities with depression between them.
4. Points towards the head.

**ELBOW.**

1. Narrower.
2. No patella.
3. Two condyles with sharp olecranon between them.
4. Points away from the head.

**Mechanism.**

Movements besides descent, are,  
Internal rotation.

Lateral flexion.  
External rotation.

### FIRST POSITION.

#### INTERNAL ROTATION.

Left buttock meets the resistance of the pelvic floor and rotates to the front.

Bisiliac diameter occupies the antero-posterior diameter of the pelvis.

#### LATERAL FLEXION.

Lateral flexion of the spine enables the child to travel along the birth canal.

Buttocks are then born, anterior one first followed by the posterior.

#### EXTERNAL ROTATION.

Restitution. Buttocks rotate back to the same oblique position which they occupied originally.

Feet escape after the buttocks, followed by the abdomen.

Shoulders descend, anterior one rotates to the front; then the chest and shoulders are born.

Head enters the pelvis, occiput towards the left and in front, suboccipito-frontal diameter engaging.

Occiput (being the most prominent part) rotates to the front.

Head is born flexed, chin, face and occiput in succession.

SECOND POSITION—Same as the first; read left for right and *vice versa*.

### THIRD POSITION.

Anterior buttock rotates from the anterior end of the left oblique diameter to the front.

Breech is born with lateral flexion of the body.

Restitution usually causes rotation in the same direction as internal rotation, for in that case the spinal concavity of the child fits the spinal convexity of the mother better i.e., the anterior hip turns to the mother's left.

Consequently the shoulders occupy the right oblique diameter.

Anterior shoulder rotates to the front.

Head descends with its antero-posterior diameter in the left oblique diameter.

Occiput rotates to the front and is born in the same way as in the first and second positions.

In some cases restitution may occur in the usual direction i.e., reverse to that of internal rotation. So the shoulders engage in the left oblique diameter and the antero-posterior diameter of the head lies in the right oblique diameter, the occiput being directed backwards. Therefore the occiput has to make a long rotation of  $\frac{3}{4}$ th of a circle to come to the front behind the symphysis pubis.

REVERSED ROTATION OF HEAD—In some of these cases occiput may rotate backwards into the hollow of the sacrum. Face may lie behind the symphysis or the chin may be caught

above it. Delivery of the head may never take place if left to natural forces.

**FOURTH POSITION**—Read right for left and *vice versa*.  
**MOULDING OF HEAD.**

Not marked, as there is very little time for it.

Occipito-frontal and occipito-mental diameters are diminished. Submento-bregmatic and suboccipito-bregmatic diameters are increased.

**CAPUT SUCCEDANEUM**—On the anterior buttock and genitals.

### Prognosis.

1. Premature rupture of membranes more common.
2. Labour more prolonged.
3. Rupture of perineum.
4. Sepsis.
5. Mortality of child is greater; varies from 1 in 3 to 1 in 6.

### CAUSES,

- (a) Pressure on the cord by the after coming head.
- (b) Premature inspiration.
- (c) Premature separation of placenta.
- (d) Pressure on the head resulting in intracranial injuries, specially in hurried delivery.
- (e) Injury of liver and adrenals.
- (f) Injury to bones and nerves.

### Management.

#### SEEN BEFORE LABOUR,

**PRIMIPARÆ**—External cephalic version, about the 36th or 37th week and apply binder. Push the head towards the chest of the child, (with the patient in Trendelenberg position) so as to maintain flexion. Best done without chloroform, lest injury to child or placenta.

Causes of failure,

- i. Extended legs.
- ii. Breech may be deeply engaged in the pelvis.
- iii. Very big child.
- iv. Twins.
- v. Tense abdominal wall and spasmodic uterus.

**MULTIPARÆ**—Version may be done but not necessary.

#### SEEN IN LABOUR,

1. Keep forceps ready.
2. Be prepared for treatment of *asphyxia neonatorum*.

#### FIRST STAGE.

Keep the patient in bed.

Ask her not to bear down.

No interference. Vaginal examinations should be done very gently so as not to rupture the membranes.

#### SECOND STAGE.

Make a vaginal examination as soon as the membranes rupture and see if the cord is prolapsed.

Leave the birth to nature and do not interfere unless there is some definite indication for it.

When the buttocks are born cover them with warm sterile towel.

When the feet are born, examine and determine the position of the arms, if extended treat as described below.

Draw down a loop of cord, feel the pulsation and decide if there is any need of hastening delivery.

If the cord is lying in the middle line, move it to one side away from the promontory so as to lessen the chances of its being pressed upon by the after-coming head.

(Some authorities do not recommend this as they think that it is not possible to shift the cord at brim by manipulations at vulva.)

When the shoulders are born encourage the patient to bear down.

Gently carry the body forwards towards the mother's abdomen.

Press on the fundus with left hand to assist expulsion of head.

Press on each side of the anus to keep the head well forward and help its expulsion.

Take precautions to prevent rupture of perineum, specially in primiparæ.

### COMPLICATIONS IN BREECH PRESENTATION.

If the baby is big and the patient a primipara with an average rigid pelvic floor we believe that the best treatment of many breech complications in tropics is Cæsarean section. For our experience is that delay and manipulations in these cases mean a dead baby and often a dead mother from sepsis.

#### 1. Early rupture of membranes.

##### DIFFICULTIES,

i. Extension of arms or head. The rim of the cervix holding back the elbow or head.

ii. Cord may be prolapsed. It may be left alone as the soft breech does not compress it too much, or a leg may be brought down.

iii. Uterine inertia.

##### TREATMENT,

Leave the breech until complete dilatation.

Bring down a leg if there is any disproportion.

*Champetier de Ribe's bag* may be used for dilatation. It produces better dilatation and so there is less risk of extension of arm or head, but this method is not recommended in tropics.

#### 2. Uterine inertia—Leave it to nature.

##### INDICATIONS FOR INTERFERENCE,

(a) A long second stage with draining away of liquor amnii.

(b) Slowing of foetal heart.

(c) Prolapse of cord.

#### TREATMENT,

Traction on the anterior groin by the right index finger; when it is free beneath the pubic arch, left index finger is used for the posterior groin.

If ineffective—Bring down a leg and apply traction by it.

Suprapubic pressure may be applied at the same time.

Application of forceps to the breech is not recommended as it may produce serious injury to the child. It is better to do Cæsarean than to lose the child.

### 3. Extension of leg.

Primary—When extended before onset of labour and X-rays have shewn it.

Secondary—When produced during labour.

#### EFFECTS,

(a) Small premature child—May not cause any difficulty.

(b) Legs lying along the trunk, increase the rigidity of the body, and labour is delayed owing to difficulty of lateral flexion of the body.

(c) Impaction of breech.

TREATMENT—Bring down the anterior leg.

#### Method.

Patient lies on her back. Use left hand if the limbs are on the right side and *vice versa*.

Pass the hand along the ventral aspect of the child and flex the knee by Pinard's method.

(a) Pressing at the bend of the knee with the fingers, backwards and outwards in relation to the child.

(b) At the same time press the leg down with the other hand on the abdomen.

Pass the fingers slightly higher up and grasping the foot and ankle pull the leg down.

It may then be left to nature or the other leg may also be similarly brought down.

### 4. Impacted breech.

#### CAUSES.

(a) Extension of leg. This produces

i. Rigidity of the trunk, and so lateral flexion of the body is difficult, if not impossible.

ii. Increases the antero-posterior diameter of the breech due to flexion of lumbar spine.

(b) Large child or small pelvis.

TREATMENT—It is a difficult condition to treat.

Anæsthetic and morphia.

Try to push the breech up, and bring down a leg as described above, but a Cæsarean section is best of all if baby is large.

Failing above,

Apply traction directly to the buttocks. Finger is usually

useless for the purpose. Rubber tube if it can be passed over the groin, occasionally succeeds.

Otherwise—Apply traction with breech hook.

Apply traction first on the anterior groin, when it is free of pubic arch transfer the traction to posterior groin.

Dangers of breech hook.

(a) Fracture or dislocation of hip.

(b) Injury of the soft parts.

Failing above,

(a) Embryotomy—Cut through the hip with sharp hook or embryotomy scissors and remove the limb. Bring the other leg down and deliver.

(b) Child's pelvis may be crushed with cephalotribe and then delivered.

## 5. Extension of arm.

Determine the position of the arms after delivery of the buttocks. If extended bring the posterior arm down first, it is easier to bring down the posterior arm.

METHOD.

Draw the body downwards and carry it forwards and upwards towards the mother's abdomen.

Pass the most convenient hand along the child's back, press two fingers into the axilla, the arm will flex. Then slide two fingers along the humerus and sweep it down over the child's face and bring the hand down to the outlet.

Hand is seized and gentle traction by it may cause the shoulder to slip over the perineum.

DELIVERY OF THE ANTERIOR ARM.

Swing the body backwards.

Pass up a hand, bend the elbow and bring the arm down as in the case of the posterior arm.

(If the posterior shoulder cannot be delivered first, it will be very difficult to bring down the anterior arm).

Failing above—Rotate the child's body (in the direction in which the back is facing and make the anterior shoulder posterior and then deliver it as a posterior arm. Often during this rotation the arm descends spontaneously.

## 6. Dorsal displacement of arm.

The upper arm is extended, while the forearm remains flexed and lies at the nape of the neck.

TREATMENT—Rotate the body gently, so that the face looks towards the forearm.

Dangers (a) Separation of epiphysis, fracture, dislocation.

(b) Injury of the brachial plexus.

## 7. Delayed delivery of the after-coming head.

Causes,

(a) Contracted pelvis.



- (b) Large head.
- (c) Extension of head.
- (d) Incomplete dilatation of cervix.

The first two must be recognised early and treated according to the degree of disparity.

#### A. DELAY ABOVE THE BRIM.

- i. Forceps—Should always be kept ready in breech cases.
- ii. Direct traction—It is more effective and more rapid, when every moment is of importance.

##### Method.

Child's body wrapped in towel, and placed straddlewise along the flexor aspect of the left forearm; middle finger of the same hand is passed well into the mouth; index and ring fingers placed on the clavicles. (Smellie). Right hand passed along the back of the child; middle finger pressed against the occiput; index and ring fingers on the shoulders and meet the fingers on the clavicle.

As the antero-posterior diameter of the head will pass the brim most easily in the transverse diameter of the pelvis, the head is rotated so that the antero-posterior diameter of the head occupies the transverse diameter (specially in flat pelvis).

An assistant applies fundal pressure from above.

Apply traction to the jaw and shoulders (from below) downwards and backwards towards the mother's anus.

The finger in the mouth simply prevents the head from being extended and this is helped by the finger on the occiput.

As the head descends, traction is gradually carried more and more forward.

When the head has left the pelvic cavity, head of the child is rotated so that the antero-posterior diameter occupies the outlet.

If forceps fail or pulsation of cord stops and there is difficulty in delivery—Perforate the head and deliver.

#### B. DELAY IN THE CAVITY.

Press firmly on the fundus.

Swing the child's body up towards the mother's abdomen.

Failing this,

Apply jaw and shoulder traction as described above, or

Apply traction by shoulder and feet (Prague method).

Place the index and middle fingers of the left hand on either side of the neck, grasp the feet with the right hand and swing the child forwards towards the mother's abdomen.

#### C. IF THE CHIN IS ANTERIOR AND CAUGHT ABOVE THE SYMPHYSIS PUBIS,

- (a) Rotate the head so as to make the chin posterior,

(not by rotating the body as that may cause fracture of the spine).

- (b) Failing above—Apply jaw and shoulder traction, body being swung back until the forehead is fixed behind the symphysis pubis and then it is carried forwards towards the mother's abdomen.
- (c) If the above fails—Apply forceps.
- (d) If forceps fail—Perforation.

### TRANSVERSE PRESENTATION.

Fœtus lies obliquely in the uterus with the head generally in one iliac fossa, and the breech higher up on the opposite side. Usually the shoulder presents.

**CAUSES**—All the factors mentioned under malpresentation.

Commonest causes being, premature child, second of twins and contracted pelvis.

**FREQUENCY**—1 in 100. More common in multiparæ hence very common in tropics.

**POSITIONS.**

1. Dorso-anterior, back in front; more common.
2. Dorso-posterior, back behind.

**DIAGNOSIS.**

**ABDOMINALLY,**

Uterus appears asymmetrical, broader below and does not reach so high up as is expected in case of longitudinal lie.

Head in one or other iliac fossa.

Trunk running obliquely to the opposite side.

Back is usually in front.

Lower pole of the uterus is generally empty.

**VAGINALLY,**

Presenting part high up.

Membranes elongated and sausage-shaped, and usually rupture very early.

Shoulder, axillary fold, scapula and ribs are usually felt.

Arm may be prolapsed.

To find out which hand, try to shake hand and decide. If the palmar surface of the child's hand comes in contact with the palmar surface of the examining fingers, it is the same hand.

Thumb points towards the head.

**PROGNOSIS.**

Depends on early diagnosis and treatment.

Mortality, mother 10 per cent., child 60 per cent.

**DANGERS.**

- (1) Early rupture of membranes.
- (2) Prolapse of cord.
- (3) Rupture of the uterus.
- (4) Postpartum hæmorrhage.
- (5) Sepsis.

## POSSIBLE COURSES IN UNTREATED CASES.

- A. Impaction resulting in,
  - i. Rupture of the uterus.
  - ii. Secondary uterine inertia.
  - iii. Death of mother from exhaustion.
  - iv. Death of child from pressure.
- B. Conceivable terminations,
  - i. Spontaneous rectification or version.
  - ii. Spontaneous evolution.
  - iii. Spontaneous expulsion.

## MECHANISM.

Natural delivery is practically impossible. Under certain conditions natural delivery may be possible but should never be expected.

1. SPONTANEOUS RECTIFICATION—Uterine contractions press on the two poles of foetus and tend to bring them in the long axis of the uterus. If it occurs at all, it will occur early in labour.
2. SPONTANEOUS VERSION—Occasionally occurs when the membranes rupture. Probably caused by strong irregular uterine contractions pushing the breech down and allowing the head to rise. In some of these cases, probably the breech occupied the lower uterine pole at the beginning of labour.
3. SPONTANEOUS EVOLUTION—If the foetus is small or macerated, pelvis capacious and uterine contractions strong, the child may be born naturally by the following process.  
Shoulder is driven down into the pelvis and the arm is prolapsed. The shoulder rotates and comes under the pubis, while the head remains above the symphysis. Ribs distend the perineum. Breech is then forced down and back is born. Then the breech distends the perineum and is later on expelled, followed by the legs and finally the head is born as in breech delivery.
4. SPONTANEOUS EXPULSION—Child is expelled doubled up with the chest and pelvis pressed together and the head and feet coming last. It is only possible with a premature or macerated foetus.

## TREATMENT.

- A. SEEN IN PREGNANCY—Find out the cause,
  - i. Contracted pelvis or pelvic tumour—Deal according to the condition found.
  - ii. Pendulous abdomen or uterine obliquity—Press the head down into the pelvis and apply binder.  
Frequent examinations should be done later on to see if the position has changed.
- B. EARLY IN LABOUR.  
Try external cephalic version.  
Failing above,

Wait till the os is two fingers dilated and then do bipolar version (with the patient in Trendelenburg position) or,

Wait till the os is sufficiently dilated to allow the whole hand to be introduced inside the uterus.

Os admitting whole hand—Internal version and bring down a leg, preferably of the same side as the hand.

If a hand is prolapsed, tie a cord to the wrist so that it does not go up during manipulations.

Membranes ruptured, os not dilated—Dilate the os digitally, and then do internal version and bring down a leg. De Ribe's bag is a hopeless aid in the tropics.

#### C. LATE IN LABOUR.

Treatment depends on the activity of the uterus.

If the uterus relaxes between pains—Version.

With morphia and full anaesthesia try to introduce the hand inside the uterus; if this is resisted by uterine contractions—Version is contraindicated.

Otherwise—Internal version.

Failing above, if the uterus is in tonic contraction, or the child is dead—Decapitation.

Shoulder fixed in pelvis, baby still alive and there is reasonable chance of the baby's survival and it does not involve extra risk to the mother—Caesarean section (lower segment).

D. VERY LATE IN LABOUR—Decapitation may be impossible; Piecemal evisceration may be the only possible way of effecting delivery.

### COMPLEX PRESENTATION.

DEFINITION—Prolapse of a limb or limbs by the side of the presenting part.

COMMONEST FORM—Arm coming down alongside the head.

CAUSES.

When the presenting part does not fit the brim properly *e.g.*,

i. Contracted pelvis.

ii. Small head.

iii. Obliquity of the uterus.

Other causes,

Hydramnios.

Dead child.

#### TREATMENT.

Find out the cause, and treat accordingly if any other abnormality is present.

##### I. HEAD AND ARM.

Clear the arm and replace it under anaesthetic. Push the collapsed hand over the front of the head and then press the head down into the brim.

Failing above, if the os is fully dilated—Push the arm into the sacral bay and apply forceps. Version should

never be done. If contraction of pelvis is present and foetus alive Cæsarean section (lower segment) best.

## II. HEAD AND FOOT.

Apply traction by the foot and push the head up.

## III. HANDS AND FEET.

Bring a leg down.

## MULTIPLE PREGNANCY.

Twins—1 in 80. Triplets—1 in 6000.

### ÆTIOLOGY.

Inherited tendency is some women.

More common in first pregnancy.

### Varieties.

#### 1. BINOVULAR,

Developed from two ova.

More common.

Sex of the children may be the same or different.

Placenta, chorion and amnion are separate.

No communication between the blood vessels of the two placentæ.

#### 2. UNIOVULAR.

Developed from,

(a) One ovum with two nuclei.

(b) Single ovum which after fertilisation divides into two blastoderms.

(c) Fertilisation of one polar body.

##### (a) SINGLE OVUM WITH TWO NUCLEI.

One chorion, one placenta.

Two amniotic sacs; later the sacs may fuse into one.

Sex always the same.

Children exactly alike.

##### (b) SINGLE OVUM WHICH AFTER FERTILISATION DIVIDES INTO TWO BLASTODERMS,

One chorion, one amnion and one placenta from the beginning.

Double monsters are usually produced by incomplete dichotomy.

Sex always the same.

Unequal development of twins may occur. One of them may be destroyed and gradually becomes compressed and mummified forming foetus compressus or papyraceus.

Method of destruction—If the heart of one of the foetuses is more powerful than the other, blood in the hypogastric artery of the weaker foetus is forced up and causes back pressure on the weaker heart. This generally produces death of the weaker foetus or may sometimes produce an acardiac monster.

**SUPERFECUNDATION**—Fertilisation of two ova, discharged at the same ovulation period by different sexual acts at short intervals.

**SUPERFETATION**—Fertilisation of two ova of different ovulation periods at interval of one or two months.

It is very doubtful if either of these ever happens. The cases which are supposed to have occurred can be explained otherwise.

### Diagnosis.

Family history.

Uterus larger than normal.

Two foetuses may be felt if they are lying alongside each other.

Two heads may be distinguished.

Large number of small parts (the limbs).

Two foetal heart sounds (at different rates).

X-rays—Two foetuses.

One head may be felt in the fundus by abdominal palpation and the other in the pelvis on vaginal examination.

### DIFFERENTIAL DIAGNOSIS.

1. **HYDRAMNIOS**—It is more difficult to diagnose when hydramnios is associated with twins as it commonly is.
2. **OVARIAN CYST**—No signs of pregnancy present.

### Prognosis.

#### EFFECTS IN PREGNANCY.

1. Pressure symptoms *e.g.*, dyspnoea etc.
2. More liable to toxæmia *e.g.*, eclampsia.

#### EFFECTS ON LABOUR.

1. Malpresentation.
2. Premature labour.
3. Prolonged labour.
4. One child may interfere with the descent of the other.
5. Postpartum hæmorrhage.

Causes,

- i. Large placental site.
- ii. Diminished power of contraction and retraction of uterus.

6. Sepsis.

Causes,

- i. Prolonged labour causing exhaustion.
- ii. Internal manipulations.
- iii. extensive loss of blood (P.P.H.)

7. Eclampsia either before or after delivery.

**CHILD**—Small, feeble and often premature.

#### COURSE OF LABOUR.

First and second stages may be prolonged.

After the birth of the first child, uterine activity ceases for 10-15 minutes, then the second child is born. The placenta or placentæ usually come away after the birth of the second

child but in some cases it may follow the birth of each child.

### Management.

Keep things ready to deal with postpartum hæmorrhage.

Leave the birth to Nature as far as possible.

After the birth of the first child,

- i. Tie the placental end of the cord as well.
- ii. Determine the lie and presentation of the second child, if transverse—Version.
- iii. When the pains return, rupture the second bag of membranes.
- iv. Indications for interference,

(a) Hæmorrhage,

Rupture the membranes at once.

Stimulate the uterus by friction or ice bag.

Pituitrin injection.

(b) Prolapse of cord.

Conduct the third stage very carefully.

If the two fetuses are presenting together—Push back the upper one and let the lower one descend.

Locked twins.

Always attempt to save the second child; first child may be sacrificed if necessary.

Cæsarean section—When the surrounding conditions are favourable and there is good chance of getting at least one living baby. Is very rare. In twenty years one of us performed Cæsarean for this reason only twice.

## CHAPTER II.

### MALPOSITION OF THE CORD.

If the cord descends in front of the presenting part, it may become compressed and cause death of the child.

**PRESENTATION OF CORD**—When the cord is in front of the presenting part and the membranes are intact.

**PROLAPSE OF CORD**—When the cord is in front of the presenting part and the membranes are ruptured.

**CAUSES**—When the presenting part does not fill up the lower uterine segment completely.

1. Contracted pelvis, specially in flat and obliquely contracted types.
2. Malpresentation.
3. Pendulous belly.
4. Hydramnios—Due to sudden gush of liquor amnii and undue mobility of the foetus.
5. Long cord.
6. Low implantation of cord.
7. Marginal insertion of cord.

#### Diagnosis.

The possibility of prolapsed cord should be suspected in the following circumstances,

- i. Presenting part is free above the brim when it should have been fixed.
  - ii. The foetal heart rate considerably diminishes during an uterine contraction and becomes faster than normal at the intervals.
  - iii. Presence of funic souffle is suggestive of the complication.
- Pulsating cord felt on vaginal examination. It can be differentiated from a loop of intestine by the fact that a finger cannot be hooked through the latter due to the attached mesentery.

#### Prognosis.

**MOTHER**—The prognosis depends upon,

- i. Cause of prolapse.
- ii. Time when it is diagnosed.
- iii. Amount of dilatation of cervix.

#### CHILD.

Mortality 70 per cent.

Earlier the cord comes down, worse the prognosis.



**Treatment.**

Treatment depends upon,

1. Cause of prolapse.
2. Condition of the membranes.
3. Condition of cervix.
4. Condition of child.

**CAUSE OF PROLAPSE**—If there is any disparity between the head and pelvis, treatment will depend upon the amount of disparity and other factors associated with it.

**MEMBRANES NOT RUPTURED,****(a) PRESERVE MEMBRANES.**

Keep the patient in bed.

No unnecessary vaginal examination.

**(b) Postural treatment.**

Sims' position best.

Knee-chest position is too tiring to be maintained for long.

Reposition gives best result if done prior to or immediately after rupture of the membranes, but they must not be ruptured before full dilatation.

**MEMBRANES RUPTURED; CASE SEEN EARLY,****OS NOT SUFFICIENTLY DILATED.**

Instrumental reposition (by string tied to a catheter). Rarely successful.

Version—Results not good.

Insertion of De Ribe's bag—The cord may be compressed between the bag and the membranes. Bag treatment not recommended in tropics; Cæsarean section gives best results to mother and child.

**AFTER REPOSITION.**

Os two fingers dilated—Bipolar version and bring down a leg.

Os nearly fully dilated—Internal version and bring down a leg.

Os fully dilated—Foetal distress, apply forceps.

If forceps are contraindicated—Version.

**MEMBRANES RUPTURED; CASE SEEN LATE.****Os not sufficiently dilated.**

- i. Child dead (cord must be felt in the intervals of pains).

Labour allowed to run its own course.

Make the delivery as easy as possible for the mother.

- ii. Pulsation (foetal) slowly returns in the intervals of uterine contractions and remains slow, intermittent and irregular.

Unless the child can be delivered with ease, it is useless to add to maternal risks in the interest of the child.

- iii. Regular and strong pulsation returns as soon as uterine contractions pass off—Manual dilatation or incision of cervix and application of forceps.

- iv. Cord pulsating well, no pressure on cord, extreme degree of pelvic contraction or oblique contraction of pelvis—Caesarean section.

### OTHER ANOMALIES OF CORD.

1. EXCESSIVE LENGTH—Predisposes to prolapse of cord and formation of knots.
2. SHORT CORD.
  - i. Relative—When it is coiled round the neck or body of the child.
  - ii. Absolute—When the length of the cord is less than normal.

DIAGNOSIS. It should be suspected in the following conditions,

- i. Delay in labour without any obvious cause.
- ii. Presenting part receding markedly between pains.
- iii. Antepartum bleeding from separation of placenta, at the end of each contraction.
- iv. Dragging pain, usually on one side of the abdomen.

#### EFFECTS.

- i. Malpresentation.
- ii. Delay in labour.
- iii. Antepartum hæmorrhage.
- iv. Rupture of the cord.
- v. Inversion of uterus.

#### TREATMENT.

Head in pelvis—Apply forceps and deliver.

As soon as the head is born, if the cord cannot be slipped over the shoulder or head, cut it with scissors and clamp the ends or press the foetal end with thumb and finger and deliver the body. Then the cord is tied.

## CHAPTER III.

### CONTRACTED PELVIS.

**DEFINITION**—A pelvis which is so shortened in one or more diameters as to alter the course of labour with a child of normal size and shape.

Measurements of the pelvis, internal and external, will indicate its shape and size. But for actual clinical purposes the amount of disparity between the head and the pelvis is the more important factor.

1. **SIZE OF PELVIS**—If all the measurements are normal or slightly increased and the finger in vagina cannot reach the promontory or the posterior half of the brim, the pelvic cavity is normal.
2. **SHAPE OF THE PELVIS.**
  - (a) Simple flat,
    - i. The interspinous diameter is nearly equal to the intercrystal.
    - ii. External conjugate diameter is reduced.
    - iii. Measurements of the outlet are normal.
    - iv. Sacral promontory can be palpated vaginally.
  - (b) Generally contracted,
    - i. All measurements are reduced.
    - ii. Outlet is less roomy.
    - iii. It may not be possible to palpate the sacral promontory vaginally.
  - (c) Funnel shaped,
    - i. Measurements of the outlet are diminished.
    - ii. Narrow pubic arch.
    - iii. Conjugate diameter may not be diminished.

### DETERMINATION OF THE RELATION BETWEEN THE FŒTAL HEAD AND BRIM OF PELVIS.

#### 1. HEAD ENGAGED.

Head sunk into the brim and fixed, *i.e.*, incapable of being moved laterally.

No disproportion.

2. **HEAD ENGAGING**—Part of the head has passed through the brim, but the largest diameter is still above it and the head can be moved from side to side. If the head can be pushed down into the brim, there is no disproportion.
3. **HEAD FLOATING**—The head is wholly above the brim and can be moved from side to side.

- i. If it can be pressed down into and through the brim—There is no disproportion.

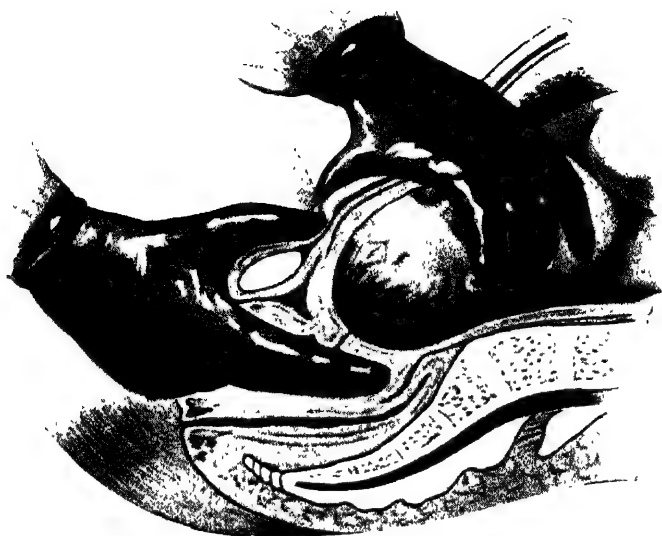


FIG. 1.

**Munro Kerr's Manœuvre.**

Index and middle fingers of right hand are pushed as high as possible into vagina toward the promontory of the sacrum with thumb over top of symphysis. Left hand above as in Pawlik's grip pushing the foetal head down into pelvis.





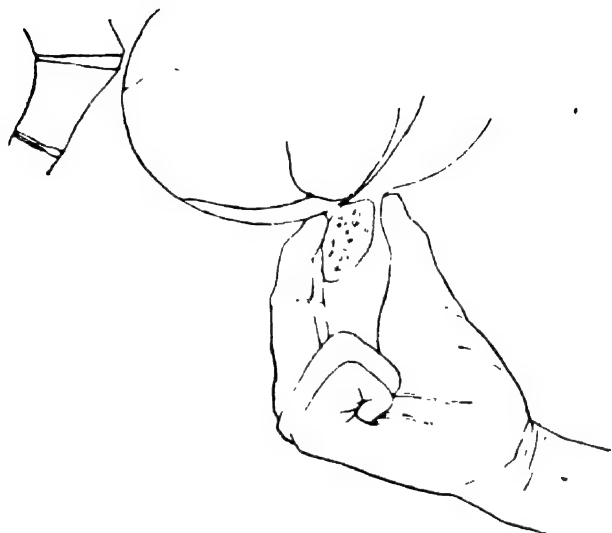


FIG. 2.

Head entering brim ; no disparity. Prognosis good. (Fitzgibbon.)

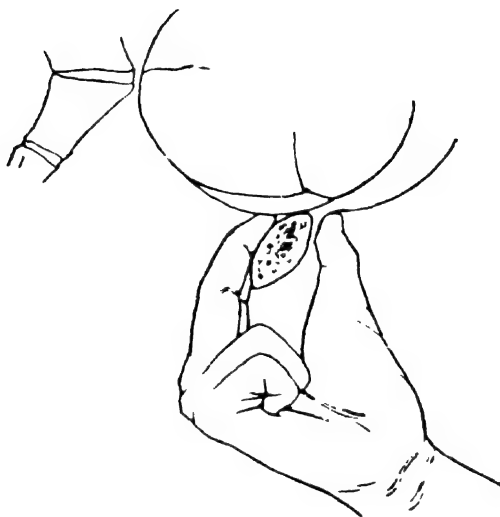


FIG. 3.

Head impinging on the thumb, showing disparity. Prognosis bad unless Cæsarean section is performed. (Fitzgibbon.)





- ii. If the head can be pressed down into but not through the brim—Labour induced in time is likely to terminate in natural delivery.
- iii. If the head cannot be pushed into the brim by any amount of pressure and it overlaps the symphysis pubis,
  - (a) If it overlaps the whole thickness of symphysis pubis and overhangs its anterior border—Very little likelihood of successful moulding and survival of the child.
  - (b) If the overlapping is only partial i.e., it overlaps only the deep border and not the anterior border of the symphysis—Successful moulding is possible and child may be delivered with the help of forceps.

The amount of flexion of the head should also be taken into consideration.

#### METHODS TO DETERMINE THE DISPARITY BETWEEN THE HEAD AND PELVIS.

1. Empty the bladder and rectum.  
Patient lies on her back.  
Push the head into the pelvis with one hand on either side of the abdomen.  
If the head can be pushed down into the pelvis there is no disparity.
2. MUNRO KERR'S OR MULLER'S METHOD. *Vide Fig. 1.*  
An anæsthetic may be necessary.  
Patient lies on her back.  
Introduce two fingers of the right hand in the vagina, while the thumb projects over the symphysis pubis.  
Head is pressed down into the brim by the left hand from above and the amount of projection of the parietal bone over the symphysis pubis is estimated by the thumb of the right hand. The vaginal fingers estimate how far the head can be pressed down into the pelvis. The amount of projection of the head over the pubis is the amount of moulding that would be necessary for the head to pass through.
3. Press the head into the pelvis.  
Place the flat of three fingers on the symphysis pubis and note how much of the head overlaps the brim.
4. FITZGIBBON'S METHOD. *Vide Figs. 2, 3.*  
Patient lies on her back.  
Introduce the index and middle fingers of the right hand into the vagina, while the thumb projects over the symphysis pubis.  
Press the head down into the pelvis by the left hand.  
Grasp the symphysis pubis between the vaginal fingers and the thumb and note the amount of overlapping of the head over the symphysis.

Conclusions from the above examinations.

- i. If the head can be pressed down into the pelvis—There is no disproportion.
  - ii. If the head overlaps the inner border of symphysis pubis but not the outer border—The head will pass through the pelvis with proper moulding.
  - iii. If the head overlaps the outer border of symphysis pubis and projects beyond it—It is unlikely that the head will pass through without serious damage to the child, if it does so at all.
5. The amount of disparity between the head and pelvis can also be determined by means of X-rays.

### VARIETIES OF CONTRACTED PELVIS.

#### I. Those due to errors in development.

1. Generally contracted pelvis *e.g.*, dwarf, infantile etc.—Very common in India.
2. Funnel shaped—Fairly common in India.
3. Non-rachitic flat.
4. Nægelé's oblique.

Defective development of one of the lateral masses of sacrum and synostosis on the same side with ilium. Symphysis pubis deflected towards the sound side; very rare.

Distances from one posterior superior iliac spine to the opposite anterior superior iliac spine are unequal on the two sides.

Shortest diameter through which a living child may be born—3" short oblique diameter.

Treatment—Usually Cæsarean section is required.

#### 5. Robert's pelvis.

Defective development of both the lateral masses of sacrum and synostosis on both sides.

All the transverse diameters are diminished and the pubic angle is very narrow.

Treatment—Cæsarean section in all.

#### 6. Split pelvis.

Symphysis pubis is replaced by fibrous tissue.

Pelvis is wider than normal.

Generally associated with other malformations *e.g.*, ectopia vesicæ.

#### II. Those due to disease of the pelvic bones.

1. Rickets—Usually flat.
2. Osteomalacia—Quite common in India.
3. Fracture.
4. New growth.
5. Caries.

III. Those due to abnormality of the spinal column.

1. Kyphotic.

Kyphosis in the upper part of the spine is compensated by lordosis at the lower part and thus the body equilibrium is maintained.

If kyphosis is so low down the spine that there is no space for compensatory lordosis, the pelvis undergoes changes to maintain the body equilibrium.

Characteristics of kyphotic pelvis.

1. Sacrum long and narrow.
2. Iliac crests flared out.
3. Increased antero-posterior diameter of the brim.
4. Posterior superior iliac spines are wide apart.
5. Pubic arch—Narrow.
6. Diminished antero-posterior and transverse diameters of the outlet.
7. Ischial tuberosities project inwards.

Diagnosis.

(a) Kyphosis.

(b) Measurements of the outlet are shortened.

Common complications,

- i. Pendulous abdomen.
- ii. Posterior position of the occiput.

Prognosis.

Not good.

Perineum is likely to be badly torn due to,

- i. Narrow pubic arch—The head is pressed backwards as there is very little room in front.
- ii. Posterior position of the occiput is common.

Shortest diameter through which a living child may be born.

The transverse and antero-posterior diameters of the outlet must be at least 3".

2. Scoliotic—Smallest diameter for the birth of a living baby, smaller sacro-cotyloid diameter,  $2\frac{1}{2}$ ".
3. Kypho-scoliotic—Combination of kyphotic and scoliotic pelves.
4. Spondylolisthetic—Body of the last lumbar vertebra is dislocated forwards.  
Generally caused by caries or congenital malformation.
5. Assimilation pelvis.

High assimilation—Last lumbar vertebra is fused with the sacrum.

Low assimilation—First sacral vertebra resembles the last lumbar vertebra.

IV. Those due to defects of the pelvic joints.

1. Synostosis of one or more of the pelvic joints.
2. Softening of one or more joints.

V. Those due to abnormalities of the lower limbs.

1. Hip joint disease.
2. Dislocation of hip.

3. Club foot.
4. Disease or inefficiency of one or both legs.

## COMMON TYPES OF CONTRACTED PELVIS.

### 1. FLAT PELVIS.

Rickets causes softening of the bones.

Body weight and muscular action acting on the softened bones cause shortening of the antero-posterior diameter and increase of the transverse diameter of the brim.

As the centre of gravity of the body passes in front of the sacrum, the promontory is pushed forwards.

The body weight acting on the sacrum tends to pull the posterior part of the ilium inwards and downwards and so the anterior part tends to move outwards. The interpubic ligament prevents the anterior extremities moving outwards, so the softened bones are bent and the transverse diameter is increased.

The anterior abdominal muscles including the Recti, during their contraction tend to pull the pubis backwards and thereby approximate the pubis and sacrum, and so the antero-posterior diameter is diminished, if the bones are soft.

The inward pressure of the femora tends to diminish the transverse diameter of the pelvis. When this pressure is absent *i.e.*, if the patient is suffering from any disease which prevents her from walking, the transverse diameter is increased. Rickety children start to walk rather late.

#### Diagnosis.

1. Conjugate diameter is diminished.
2. Interspinous diameter is nearly equal to the intercrystal diameter.
3. Posterior interspinous diameter is diminished.
4. Normally the posterior interspinous diameter is  $\frac{1}{3}$  of the anterior interspinous, in flat pelvis it is about  $\frac{1}{4}$  or even  $\frac{1}{5}$ .
5. X'ray pelvimetry.

#### Effects during pregnancy.

1. Uterus may become incarcerated in the pelvis about the third month.
2. In later part of pregnancy, the presenting part may be freely moveable above the brim, as it cannot be engaged.
3. Malpresentation.
4. Pendulous belly.

#### Effects during labour.

##### FIRST STAGE.

1. Malpresentation.
2. Glove-finger projection and premature rupture of the membranes.
3. Cord is likely to be prolapsed.



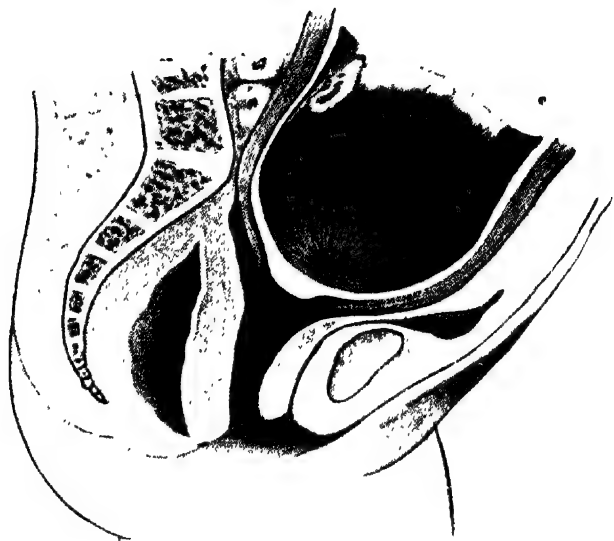


FIG. 4.

Cervix taken up ; normal bag of membranes.  
Prognosis good. (Fitzgibbon.)

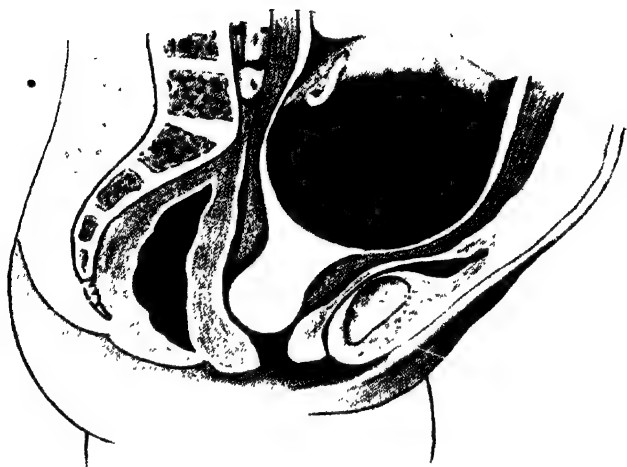


FIG. 5.

Cervix not taken up. Large bag of waters projecting into vagina. Showing cervix hanging like a curtain. Prognosis bad. (Fitzgibbon.)







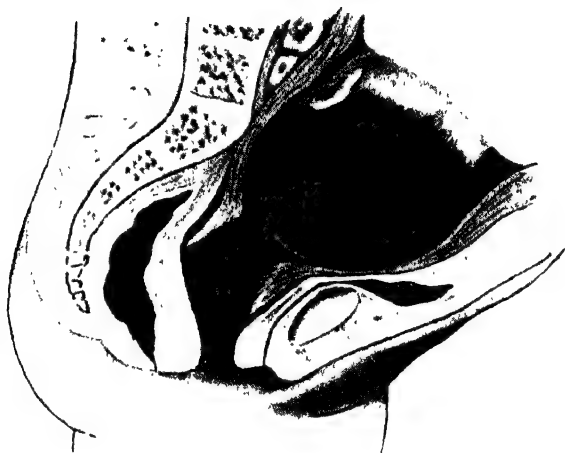


FIG. 6.

Membranes have ruptured and vaginal portion of cervix has reformed ; hanging like a curtain into the vagina. Prognosis bad. (Fitzgibbon.)



FIG. 7.

Cervix has moved back on the head. The posterior lip is turned out and high up but the anterior lip is elongated and œdematous. Prognosis bad. (Fitzgibbon.)



4. Delay in the first stage of labour.
5. Anterior lip of the cervix is likely to be nipped between the head and pelvis, becomes oedematous and offers obstruction.

## SECOND STAGE.

Antero-posterior diameter of the head occupies the transverse diameter of the brim.

Bi-parietal diameter is the greatest transverse diameter of the head and therefore encounters greatest resistance. It is nearer the occipital than the frontal end of the head. Therefore, when this diameter is held back, head becomes extended and a brow or face presentation may result.

### POSTERIOR PARIETAL PRESENTATION OR NÆGELÉ'S OBLIQUITY.

The anterior parietal bone is lower than the posterior, so that the sagittal suture does not lie at the middle of the brim but nearer to the promontory. This causes engagement of subparieto-superparietal diameter across the pelvis, which is smaller than the bi-parietal diameter. So the anterior parietal presentation is very favourable.

## MECHANISM.

THE ANTERIOR PARIETAL BONE is pressed against the symphysis pubis and the posterior parietal bone is forced slowly down past the projecting sacral promontory by rotation along the long axis of the head. The anterior parietal bone maintains its lower position until the greatest diameter of the head passes the brim. In these cases traction with forceps brings the posterior parietal bone round the promontory.

### POSTERIOR PARIETAL PRESENTATION.

The posterior parietal bone is lower than the anterior. It is unfavourable, because,

1. Head cannot enter the pelvis until the posterior parietal passes beyond the promontory.
2. The line along which uterine force is transmitted is given a different direction at the neck, which is much less advantageous than when the spinal column and the head form a continuous axis (Williams).
3. On traction with forceps, the anterior parietal bone is pulled against the symphysis pubis.
4. Indicative of pronounced disproportion.

### MECHANISM OF AFTER-COMING HEAD.

Long diameter of the head lies transversely.

The part of the head opposite the promontory is generally retarded and so extension occurs. This may be helped by traction on the shoulders; condyles being nearer the posterior end of the head the occipital end is pulled lower down during traction.

Nægelé's obliquity may be present.

**THIRD STAGE**—More liable to postpartum hæmorrhage due to exhaustion.

**EFFECTS ON PUERPERIUM.**

1. Sloughing of the soft parts covering promontory and symphysis pubis due to excessive pressure on these structures.
2. Sloughing of the bladder wall—May cause vesico-vaginal fistula; of rectal wall, recto-vaginal fistula.
3. Perforation of the uterus when the slough separates or utero- or cervico-vesical fistula.
4. Rupture of the uterus, rare.

**EFFECTS ON THE CHILD.**

1. Abrasions on the head.
2. Spoon shaped depression on the parietal bone.
3. Intracranial hæmorrhage.
4. Excessive moulding of the head.
5. The prognosis is better than in generally contracted pelvis as only one diameter of the pelvis is diminished and the total area of the brim is greater.

**GENERALLY CONTRACTED PELVIS.**

All the diameters of the pelvis are less than normal. This is the commonest type of contraction in India due to early maturity and early marriage.

**Diagnosis.**

1. Patient generally small.
2. All pelvic measurements are less than normal.
3. Promontory is usually high up but nearer to the pubis than in normal cases.
4. Normally the ratio of the anterior interspinous diameter to the posterior interspinous diameter is 1 : 3. In generally contracted pelvis it is 1 : 2 or  $2\frac{1}{2}$ .
5. X'ray pelvimetry.

**EFFECTS DURING PREGNANCY**—eclampsia and albuminuria more common.

**EFFECTS DURING LABOUR.****FIRST STAGE.**

1. No undue tendency for malpresentation.
2. No tendency to premature rupture of the membranes or prolapse of cord.
3. In case the membranes rupture early,
  - i. Cervix may be nipped between the head and symphysis pubis and becoming œdematous offer further obstruction to delivery.
  - ii. Similarly vagina and vulva also become œdematous.

**SECOND STAGE.**

1. Internal rotation occurs rather early.
2. Large caput succedaneum.
3. Extreme flexion of head.
4. Shoulders may be impacted.
5. Extreme moulding of the head.

After-coming head.

1. Head in extreme flexion.
2. Arms may be caught at the brim and may get extended.

THIRD STAGE.

1. Risk of postpartum hæmorrhage due to exhaustion of the uterus.
2. This type of pelvis is the commonest cause of complete rupture of the perineum.

PUERPERIUM—Sloughing may occur at any part subjected to excessive pressure.

CHILD.

- i. Large caput succedaneum.
- ii. Abrasions on the head.
- iii. Intracranial hæmorrhage.
- iv. Still birth.

OBLIQUE PELVIS.

1. Naegelé's pelvis.
2. Deformity of the pelvis caused by unilateral disease of the lower limbs, e.g., hip joint disease, talipes, etc.  
Occiput usually occupies the more roomy side of the pelvis.  
If it is on the contracted side, difficulties are sure to occur.  
Smallest diameter for the birth of living child—3" smaller oblique diameter.

CONTRACTION OF THE OUTLET.

1. Kyphotic.
2. Male type.
3. Funnel shaped.
4. High assimilation.

Funnel shaped pelvis is more common in India than is usually realised. We think it to be due to mild osteomalacia or food deficiency in childhood or at puberty.

The danger of this condition is that it is rarely suspected or diagnosed until the head is at the outlet when, if the foetus is alive, the only hope is the lower uterine segment Cæsarean. Too often in India craniotomy is the price of ignorance and carelessness both ante- and intranatally.

TREATMENT.

Mild degrees may be allowed to go to term.

Post-maturity must not be allowed as the head becomes too hard for moulding.

Transverse diameter of the outlet  $3\frac{3}{4}$ " or more—Natural delivery may be expected but perineum is liable to be badly torn or coccyx injured.

Transverse diameter of the outlet  $3\frac{1}{2}$ " or less—Cæsarean section, unless size of foetus small.

Induction of labour about the 38th week is not very satisfactory form of treatment; so if in doubt, it is better to do Cæsarean section.



When in labour, postural treatment, an exaggerated lithotomy position or Sims' position, is of great value.

### PROGNOSIS OF CONTRACTED PELVIS.

The more one sees of obstetrics the more difficult it is to be absolutely didactic, for frequently patients with everything seemingly normal have difficult labours and those with circumstances against them have easy ones.

For this reason we are inclined to think that unnecessary emphasis is put upon pelvic measurements. Twenty years at the Eden Hospital have convinced one of us that there are only two external measurements of real value; one the conjugate, the other, the transverse diameter of the outlet immediately in front of the anus.

What one has to concentrate upon is:—

1. The relation of the foetal head to the pelvis.
2. Whether it is flexed or extended.
3. Whether it can descend below the horizon of the brim without overlapping;
4. Whether the lie of the child is anterior or posterior.

The pelvic grip, Pawlik's grip, and placing the flat of 3 fingers upon the symphysis will give this information.

If a vaginal examination is performed,

1. Try to feel the promontory of the sacrum.
2. Estimate the size of the sub-pubic angle.
3. Endeavour to compute the degree of possible descent of the head into the pelvis by the Munro Kerr or Fitz-Gibbon manoeuvre.

In the tropics, where maturity and marriages are early, small round pelves and posterior positions are the two most common sources of difficulty.

Therefore one must always be on the *qui vive* as to the degree of disproportion which may necessitate intervention; for experience has taught that 70 per cent. of tropical obstetric calamities such as eclampsia, septicæmia, complete rupture of the perineum, vesico-vaginal fistula and dead babies are subsequent to long labours in women with posterior positions or small round pelves.

This being so, whether in hospital or in private practice, one is confronted with the problem of

- (1) induction of premature labour,
- (2) test labour, or
- (3) Cæsarean section in any case where clinical examination suggests disproportion.

Provided the patient has arrived at the 38th week and disproportion is of the slightest, and especially if she is a primipara, induction has many advocates, that is provided the course of labour can be carefully watched in a hospital, for, in that case the labour is to all intents and purposes a test labour, during which surgical intervention is possible, should such circumstances as foetal distress and delayed progress demand it.

But bear in mind that a premature child in 70 per cent. cases is bodily and intellectually below that of full term one. Moreover the defective development of blood vessels and elastic tissue are causes of brain injuries if labour is difficult. For if by forceps or soft parts, the head is compressed before full flexion in the occipito-frontal diameter, there is far greater risk of tears of the tentorium cerebelli than when the pressure is made in the suboccipito-bregmatic. Therefore we consider that induction is only justifiable when the health and life of the mother demand it.

Rules and principles in the West are not invariably applicable in the tropics, for due to diet deficiency (particularly vitamins A, B and D) and an average 20 per cent. hæmoglobin deficiency in all women in the tropics, there is diminished resistance to infection and obstetric shock.

Moreover, uterine inertia is far more common in the East, due to flabby abdominal muscles, or disease and this may jeopardise a seemingly good prognosis.

For these reasons test labour at full term, or even induction at the 38th week, is fraught with dangers which are hardly considered in the West—dangers resulting frequently in the doctor having the melancholy duty of informing the parents that the baby is dead and the mother very ill.

Every case is a law unto itself; but one must realize what disproportion means and be prepared to face the difficulties, and understand that it is a dreadful thing to perforate the head of a living foetus, when a Cæsarean section would conserve both mother and baby.

In order to confirm these convictions we have reviewed the last hundred Cæsarean sections performed by one of us in hospital and in private practice. We find that 65 per cent. were operated upon because the head was lying non-flexed, in a posterior position, and was overlapping the brim; 51 per cent. of these women had been more than 24 hours in labour when Cæsarean section (lower uterine) was performed, and many were post-mature.

Remember, therefore, the old mnemonic: flexion means descent, descent means rotation, rotation means easy labour; non-flexion means non-descent, non-descent means non-rotation, non-rotation means difficult labour. Only constant palpation of the full-term pregnant uterus in a hospital can give the graduate any sense of security as regards prognosis and the best treatment.

To sum up, in the West for slight disproportion, induction or trial labour, followed or not by Cæsarean section has the blessing of authority; whereas in the tropics induction and test labour have certain known dangers, which Cæsarean section does not possess in capable hands.

## TREATMENT OF CONTRACTED PELVIS.

### Seen in pregnancy.

Three courses of treatment possible.

1. To allow the pregnancy to go to term and then assist delivery if necessary.
2. To induce labour about the 37th week.
3. To perform Cæsarean section at term.

**GENERALLY CONTRACTED PELVIS**—Add  $\frac{1}{4}$ " to the measurement of true conjugate of flat pelvis and treat accordingly.

### FLAT PELVIS.

True conjugate 3" or less—Cæsarean section at term.

True conjugate  $3\frac{3}{4}$ " or more—Leave it to nature.

Assist delivery with forceps if necessary.

True conjugate between 3" and  $3\frac{3}{4}$ ".

**CÆSAREAN SECTION IS PREFERABLE** in the following,

1. If the head cannot be pushed into the brim at thirty-seventh week.
2. Elderly primigravida in whom there is very little likelihood of another pregnancy.
3. Any malpresentation which cannot be rectified and kept as vertex.
4. Labour at term has produced dead children.
5. More suitable when the patient is treated in a hospital.

**INDUCTION OF LABOUR MAY BE CONSIDERED,**

1. If the head can be pushed into the brim at thirty-fifth week but not at thirty-seventh week or it is just possible to do so by Munro Kerr's method.
2. Young primigravida—It will amount to trial labour, which can be assisted by forceps or surgery if necessary.
3. In private practice.

**CONTRA-INDICATIONS FOR INDUCTION OF LABOUR.**

1. If by Munro Kerr's method it is found that the pelvis is too small for the head.
2. Attitude of the head is bad.

**Note**—i. Induction of labour gives disappointing results in the tropics; but undoubtedly has definite indications if the case is clean, certain dangers can be guarded against and surgical assistance of the first order available. It is,

- (a) More liable to sepsis.
- (b) More liable to uterine inertia.

ii. If induced before thirty-seventh week—High foetal mortality.

iii. If forceps are used, the mortality is higher still, specially if labour is induced before the thirty-seventh week.

**METHOD.**

1. Krause's bougies.
  2. Stomach tube.
  3. Castor oil, quinine and pituitary before, during or after the bougie or stomach tube method has failed.
  4. Rupture of the membranes by high or low method.
- For these various methods *vide* p. 255-257.

**TRIAL LABOUR.**

In contractions of medium degree, if no contra-indications are present it is best to allow the labour to start and keep a careful watch on the progress and decide whether natural forces will effect delivery with the aid of forceps if need be or such an operation as Cæsarean section will be required.

**MANAGEMENT OF TRIAL LABOUR.**

If rupture of the membranes is followed by prolapse of cord—Cæsarean section.

Note the force and efficiency of uterine contractions.

Note the amount of advance during each interval of time—If no advance after waiting for six hours, it is hopeless to expect natural delivery.

Don't mistake an increasing caput succedaneum for advance of head

Note the foetal heart sounds—If the child is in distress help delivery.

Note the condition of the patient.

If signs of exhaustion (*e.g.*, rising pulse and temperature, diminution in the strength of uterine contractions) are coming on—Interference is indicated.

If only slight advance after four hours,

- (a) If the promontory can be felt, (it indicates flat pelvis)—Wait.

Foetal or maternal distress—Forceps if cervix *fully dilated*.

Failing forceps—Cæsarean section may be considered.

If Cæsarean section is contra-indicated—Perforation.

- (b) If the promontory cannot be felt, it indicates generally contracted pelvis—Cæsarean section.

**Seen early in labour.**

**VERSION**—Very high foetal mortality. Not done.

**FORCEPS**—If the amount of disparity is very little, use axis-traction forceps.

**Note**—Walcher's position increases the antero-posterior diameter of the brim by  $\frac{1}{2}$ ", but it infers a high forceps operation, which is very risky.

**CONTRA-INDICATIONS,**

- i True conjugate—Less than  $3\frac{1}{4}$ ".
- ii Dead child—Perforate.
- iii Never use brute force.

- iv. If no advance with three good strong pulls, forceps should be abandoned.

**CÆSAREAN SECTION**—If the parents are very keen to have a living child and there is no extra risk—Lower segment Cæsarean is best.

**SYMPHYSIOTOMY AND PUBIOTOMY**—Very seldom performed. We do not do this operation now.

**INDICATIONS OF SOME CLINICS.**

- i. Amount of disproportion is small, child living and head in the brim.
- ii. Os fully dilated, second stage of labour lasted three hours and forceps have failed with the patient in Walcher's position.

**CONTRA-INDICATION—Infection.**

**DANGER.**

1. Laceration of urethra.
2. Hæmorrhage
3. Sepsis.
4. Injury of bladder.
5. Difficulty in locomotion later.

Post operative treatment—Broad bandage round the pelvis.

**Seen late in labour.**

A. CHILD DEAD—Perforation.

B. CHILD ALIVE,

i. CONDITION OF MOTHER,

If good, (as indicated by pulse, temperature and general physical condition)—Cæsarean section or forceps, according to surrounding conditions.

If bad—Perforation.

ii. CONDITION OF UTERUS,

Contractions good—Cæsarean section or forceps.

Whether relaxing between the pains,

If no relaxation—Perforation.

iii. WILL THE HEAD COME THROUGH

1. Head unengaged above the brim.

The advisability of Cæsarean section will depend upon

(a) How long the membranes have ruptured.  
Longer the membranes have ruptured, greater the risk of infection.

(b) Examinations and manipulations carried out and the chances of infection.

(c) General condition of the mother.

(d) Chances of getting a child that will survive.

If Cæsarean section is contra-indicated—Perforation.

2. Head engaged in the brim—Forceps.

Failing forceps—Perforation.

Cæsarean section—Advisable if baby alive and conditions favourable.

Version may be tried when forceps have failed in flat pelvis but never in generally contracted pelvis.

It must always be remembered that the maternal mortality of a difficult craniotomy from sepsis and hæmorrhage is double that of a properly performed lower uterine segment Cæsarean in the tropics.

## CHAPTER IV.

# ANOMALIES OF UTERINE FORCES.

## PRECIPITATE LABOUR.

**DEFINITION** When the uterine contractions are very strong and follow one another rapidly and the resistance of the pelvic floor is less than normal, labour may be terminated in a few minutes.

The patients are usually multiparæ.

If the pelvis offers normal resistance laceration of the cervix and rupture of perineum are usual.

If the resistance is unsurmountable, uterus may be ruptured.

### TREATMENT.

**FIRST STAGE**—A patient known to have rapid labour should be kept in bed.

**SECOND STAGE**—Administer chloroform to control the pains.

**THIRD STAGE**—Must be conducted with care.

Examine carefully for lacerations of genital canal.

Inversion of the uterus may occur. Intra-cranial hæmorrhage may occur in the child due to precipitate moulding of the skull before full flexion has occurred.

## UTERINE INERTIA.

### SLUGGISH UTERUS OR PRIMARY UTERINE INERTIA.

Sluggish uterus or primary uterine inertia—The uterine forces have been inefficient from the beginning.

#### Causes.

1. Primary weakness of the uterine muscle, obesity.
2. Overdistension or displacement of the uterus.
3. Anything which fixes the uterus *e.g.*, ventro-fixation.
4. Reflex nervous inhibition.
5. Spasm of cervix; usually associated with elderly primigravida.
6. Deficiency of hormone stimulation.
7. Tumours of uterus.
8. Premature rupture of membranes
9. Malpresentation.
10. Distended bladder or rectum.
11. Adhesion of the membranes near the os.
12. Constitutional effects *e.g.*, wasting diseases.
13. Incoördination between the sympathetic and parasympathetic nerves supplying the uterus.

**Symptoms.**

Uterine contractions are very weak and feeble.

Labour makes very little progress.

Uterus is soft and relaxed.

No sign of constitutional disturbance.

**Treatment.****BLAIR BELL'S ANTEPARTUM TREATMENT.**

Patients who have suffered from primary uterine inertia in previous labour are liable to get it again. So Blair Bell recommends the following treatment for them,

Calcium carbonate . . . gr. 75

Acid lactic . . . gr. 200

Aqua chloform . . . oz. 8

About two ounces of this mixture every night, and  $\frac{1}{4}$  c.c. of pituitrin, morning and evening for a fortnight before labour is due.

In the tropics we consider that the best results are obtained by asking all patients to take 5 grains of quinine a day during the last six weeks.

**FIRST STAGE.**

Maintain strength of the patient. Give honey or glucose by mouth.

Evacuate bladder and rectum.

Give a hot bath or vaginal douche.

Patient encouraged to move about.

Failing above—If the patient is getting tired, chloral 20 grains or inject 3 grs. of sodium luminal or nembutal or scopalamine gr. 1/100, every  $\frac{1}{2}$  hr. for 3 doses.

Irregular uterine contractions causing distress—Morphia gr.  $\frac{1}{4}$ .

**SECOND STAGE.**

Early rupture of membranes—Do not interfere unless the mother or child is in distress.

If the second stage has lasted for more than two hours and the os is fully dilated—Inject  $\frac{1}{4}$ —1 c.c. of pituitrin. If the head is not expelled in 15-20 minutes apply forceps and deliver. In breech presentation, bring down a leg.

**SPASM OF THE CERVIX.**

1. Chloral hydras 20 grains, every 4 hours for three doses.

Morphia gr.  $\frac{1}{4}$  or scopolamine as above.

2. Signs of exhaustion of the mother or distress of the child.

i. Dilate the cervix manually if soft and apply forceps.

ii. Cæsarean section, specially in the case of elderly primigravida.

3. Child dead—Perforation.

**UTERINE EXHAUSTION OR SECONDARY UTERINE INERTIA.**

In this condition normal uterine contractions have been present, but the pains gradually become weaker, with longer intervals and finally tend to disappear entirely owing to uterine exhaustion



**Causes.**

1. Multiparæ with poor uterine musculature.
2. Abnormal resistance to the passage of the child, *e.g.*, pelvic contraction.
3. May follow antepartum hæmorrhage, overdistension of the uterus or sluggish uterus.
4. Overdistension of any of the pelvic viscera.
5. Abnormalities of foetus regarding presentation, position and size.

**Symptoms.**

Labour generally starts as in normal cases and then the pains gradually become more and more feeble. In some cases the labour may start as in primary uterine inertia and persist through the second stage of labour.

Uterine exhaustion is rarely seen in the first stage.

**DANGER**—If the uterus is emptied during a phase of exhaustion, there is great risk of postpartum hæmorrhage.

**Differential diagnosis.**

	Uterine exhaustion.	Tonic contraction.
1. General condition of the patient.	1. Anxious, drawn expression.	1. Restless; patient looks anxious and ill.
2. Pulse, respiration and temperature.	2. Gradually rise.	2. Pulse—rapid. Respiration—hurried. Temperature—raised.
3. Abdominal palpation.	3. Abdomen not tender. Uterus—Flaccid, but tender. Foetal parts may be easily felt.	3. Abdomen very tender. Uterus—hard. Foetal parts cannot be easily distinguished.
4. Vaginal examination.	4. Little or no caput succedaneum.	4. Large caput succedaneum. Vagina may be cedematous.
5. Foetal heart sounds.	5. Usually can be heard gradually decreasing in speed and in timbre.	5. Generally absent.

**Treatment.**

Empty the bladder and rectum.

Give hypnotic—Tinct. opii  $\frac{1}{2}$  dr. or morphia gr.  $\frac{1}{4}$  or scopolamine as above.

When the patient wakes up, if the head is on perineum and cervix dilated and there is no obstruction—Inject 3 minims of pituitrin and if there is no progress in 15 minutes, apply forceps.

Always be prepared for postpartum hæmorrhage.

As the patient is liable to infection, give an injection of 2 c.c. of nucleic acid as a prophylactic measure or 10 c.c. of aolan, or 30 c.c. of antistreptococcal polyvalent serum.

**TONIC CONTRACTION OF THE UTERUS.**

**Definition**—Tetanic contraction of the uterus.

If there is insuperable obstruction to delivery, the progress of labour is modified as below,

First phase—Labour starts as in a normal case.

Second phase—Signs of uterine exhaustion appear.

Third phase—Uterus starts contracting more strongly.

Fourth phase—In a short time tonic uterine contraction supervenes.

**Pathology**—With each contraction of uterus, the upper and lower uterine segments become more and more differentiated, due to retraction of the muscle fibres of the upper segment and stretching and thinning of the lower uterine segment. The junction of the two segments is marked by a well defined ridge which may be felt per abdomen and is called the *retraction ring* or *Bandl's ring*.

**Cause.**

1. Obstructed labour.

2. Administration of ergot or pituitrin in unsuitable cases.

**Symptoms and signs.****MOTHER.**

Anxious expression, restless.

Pulse, rapid. Temperature may be raised.

Cramp like pain in the abdomen.

**UTERUS.**

Hard and tender.

Moulded to the shape of the child.

Retraction ring may be felt per abdomen.

CERVIX—Hanging in an œdematous condition *vide* fig. 7.

VAGINA AND VULVA—Dry and œdematous. Liq. amnii smells.

**FŒTUS.**

Fœtal parts cannot be felt.

Absence of heart sounds.

Overlapping of the bones of the skull.

Large caput succedaneum.

**Dangers.**

1. Rupture of the uterus.
2. Soft parts subjected to excessive pressure, may become necrotic and slough out and thereby fistulae may be formed.
3. Infection.

**Diagnosis** —Differentiation between uterine exhaustion and tonic contraction of the uterus, see page 168.

**Treatment.**

1. To diminish the uterine spasm,  
Morphia gr.  $\frac{1}{3}$  to  $\frac{1}{2}$ .  
Full surgical anaesthesia with chloroform or spinal anaesthesia.
2. Delivery of the child,  
As soon as the spasm passes off—Craniotomy or other destructive operation, as the child is nearly always dead.

**CONTRACTION RING.**

**Definition** —Localised contraction of a band of circular muscle fibres (over a point of slight resistance, *e.g.*, groove of the neck of child) which may form in any part of the uterus in any stage of labour.

**Cause.**

Probably due to inherent abnormal irritability of the uterus. Some authorities think it to be due to incoördination between the sympathetic and parasympathetic nerves supplying the uterus.

**PREDISPOSING CAUSES,**

1. Premature rupture of the membranes.
2. Intra-uterine manipulations.
3. Malpresentations. It is rather more common with occipito-posterior position.
4. Infection.

**Symptom** —There are hardly any symptoms until those of obstruction develop.

**Diagnosis** —Can only be arrived at by feeling the ring on vaginal examination.

Differentiation between contraction and retraction ring (Clifford White).

**Contraction ring.**

1. Localised thickening of the uterine wall.
2. Site of the ring is thicker than the uterine wall above and below.
3. Presenting part not forced into the pelvis.

**Retraction ring.**

1. Forms at the junction of upper and lower uterine segments.
2. Uterine wall above the ring is thicker than below.
3. Presenting part firmly wedged into the pelvis.

**Contraction ring.**

4. Uterine wall below is not thinned.
5. Child may be completely above the ring.
6. The part of uterus above the ring relaxes between pains and is not tender.
7. May occur at any stage of labour and does not change its position.
8. Can hardly be felt on abdominal examination.
9. Not necessarily accompanied by disturbing general sings.
10. Cause—Intra-uterine manipulation or premature rupture of membranes.

**Retraction ring.**

4. Uterine wall below is thinned.
5. Child is never completely above the ring.
6. Part of uterus above the ring does not relax between pains and is tender.
7. Forms late in labour and gradually moves higher and higher.
8. Can often be felt abdominally.
9. General condition is always bad.
10. Cause—Obstructed labour.

**Treatment.**

Morphia gr.  $\frac{1}{4}$ . Four hours later full chloroform or spinal anaesthesia. Investigate the condition of uterus.

Manual dilatation of the ring is successful only in early cases. But we do not advise it.

If the condition is diagnosed early, version may be successful.

If necessary continuous traction may be applied to the breech.

Willet's method of continuous traction—Willet's forceps or volsellum or if baby dead a cranioclast is attached to the head and continuous traction is applied by attaching a weight of about 6 pounds to it.

If the uterus relaxes with anaesthesia—Apply forceps and deliver.

If no relaxation,

- (1) Early in labour—Any of the above methods may be tried but there is very little chance of success.
- (2) Caesarean section is best in most cases. If the case is septic, uterus should be removed. In some cases it is better to remove the unopened uterus to avoid infection.

Craniotomy is very difficult when the head is above the ring and is obviously of no use when the head is below the ring.

**IRRITATED OR GENERALLY CONTRACTED UTERUS.**

**DEFINITION**—The entire uterus is in a overactive or hyper-irritable condition. It differs from tonic contraction in that there is no stretching of the lower uterine segment.

Any uterine manipulation is resented by the uterus and may cause rupture. It is rare, generally in young nervous primiparae.

**TREATMENT.**

Morphia gr.  $\frac{1}{4}$ . Chloroform or spinal anæsthesia or scopolamine.

After an interval of half to one hour, uterus may permit manipulations and the child is delivered with forceps or by version.

Failing above—Lower segment Cæsarean section.

**COLICKY UTERUS.**

**DEFINITION**—Uterine contractions occur regularly, but only cause intense discomfort and the labour does not progress.

**TREATMENT**—Injection of morphia gr.  $\frac{1}{4}$  or scopolamine 1/100 gr. hypodermically every  $\frac{1}{2}$  hour for 3 doses.

**DELAYED LABOUR.****Causes.**

Faults in

- (1) Power.
- (2) Passage.
- (3) Passenger.

**I. FAULTS IN POWER.**

- i. Uterine inertia, primary and secondary.
- ii. Anæmia.
- iii. Multipara.
- iv. Hydramnios.
- v. Pendulous belly.

**II. FAULTS IN PASSAGE.**

- i. Full bladder.
- ii. Full rectum.
- iii. Conditions of cervix.
  - (a) Early rupture of the membranes.
  - (b) Rigidity due to
    1. Old inflammation or operation scarring.
    2. New growth.
    3. Spasm (try chloroform or chloral 30 grains or morphia gr.  $\frac{1}{4}$  or scopolamine gr. 1/100 as above).
    4. Atresia (common in India due to previous difficult labour).
    5. Œdema, often seen in small round pelvis and flat pelvis.
- iv. Contraction ring.
- v. Contracted pelvis.
- vi. Tumours outside and in the uterus.
- vii. Elderly primipara.

**III. FAULTS IN PASSENGER.**

- i. Malpresentation.

- ii. Large or post-mature child.
- iii. Abnormalities of the foetus *e.g.*, hydrocephalus or monsters.

**Treatment.**

Treat according to the cause.

Organic rigidity of the cervix—Incise the cervix or better Cæsarean.

Carcinoma or fibroid of the uterus—Cæsarean section.

Atresia of the cervix—Puncture at the site of the os and then dilate the hole. We have several times seen this succeed. Or, Cæsarean section.

**POST-MATURITY.**

When pregnancy is prolonged beyond normal term, the child is always of more than average weight and size. Owing to the abnormal size and unusual hardness of the head, there is always difficulty in labour, and of those born 10 days or more after the expected full term, 50 per cent. are born dead, die *in utero* or are injured during delivery. The mother also runs all the risks of delayed labour, *e.g.*, sepsis, hæmorrhage etc.

We have found that the liquor amnii in all cases of true post-maturity is of the colour of turmeric or French mustard and the baby's hair is also stained the same shade. Such discolouration is of bad prognosis, the baby being born dead or dying shortly after delivery in most cases. We advise lower segment Cæsarean section where saffron coloured liquor amnii is seen early in labour (owing to premature rupture of the membranes), and the foetal heart sounds are good.

Induction of labour is contra-indicated if there is any disparity between the foetal head and the pelvis. Cæsarean section should be done.

The green yellow staining of the amnion and liquor amnii is due to blood changes, probably in the placenta. We consider that the importance and gravity of post-maturity is not sufficiently appreciated by nurses, doctors and public in India.

**OBSTRUCTED LABOUR.**

When delivery by the natural forces becomes impossible owing to the presence of some mechanical obstruction.

**EFFECTS OF OBSTRUCTED LABOUR.**

Before rupture of the membranes—No danger.

Early rupture of the membranes.

May cause death of the foetus and exhaustion of the mother.

Excessive pressure on the soft parts may cause necrosis.

Rupture of uterus.

**SIGNS.**

No advance in spite of good pains.

Signs of exhaustion of the mother. Rapid pulse, hurried respiration, raised temperature, dry vagina etc.

Signs of foetal distress. Meconium may be passed, tumultuous movements of the foetus, pulse rate over 160, or below 120 per minute.

Large caput succedaneum.

#### TREATMENT.

Remove the cause of obstruction before or after doing Cæsarean section.

If the uterus is in tonic contraction treat accordingly.

In the tropics these cases are often due to osteomalacia or impacted tumours and are seen late in labour. Frequently they necessitate hysterectomy before or after emptying the uterus.

## INJURIES OF THE GENITAL CANAL.

### RUPTURE OF THE UTERUS.

**SPONTANEOUS**—When caused by the activity of the uterus alone.

**TRAUMATIC**—When caused by intra-uterine manipulations or direct injury to the uterus.

Both types, due to prejudice and neglect frequently occur in India.

#### **Causes.**

##### **SPONTANEOUS.**

*During pregnancy.*

- (1) Degeneration of uterine muscle.
- (2) Cicatrix of previous Cæsarean section.
- (3) Uterine wall injured in a previous pregnancy, *e.g.*, manual removal of adherent placenta.
- (4) Pregnancy in the rudimentary horn of a bicornuate uterus or cornual pregnancy.

*During labour.*

- (1) Obstructed labour.
- (2) Degeneration of the uterine muscle.
- (3) Deviation of the axis of uterus *e.g.*, pendulous belly.
- (4) Cicatrices of the uterine wall *e.g.* after myomectomy or Cæsarean.
- (5) Unusually prominent promontory.
- (6) Precipitate labour.
- (7) Carcinoma of cervix.
- (8) Injection of pituitrin in obstructed labour.

##### **TRAUMATIC.**

- (1) Blow or fall on the abdomen.
- (2) Intra-uterine manipulations when uterus is in tonic contraction (usually during internal version).
- (3) Trying to effect delivery with insufficiently dilated os.
- (4) Removal of placenta roughly without an anæsthetic.

#### **Varieties of rupture.**

- i. **COMPLETE**—When the rent passes through the whole thickness of the uterus.
- ii. **INCOMPLETE**—When the rent does not pass through the whole thickness of the uterine wall. The uterine cavity does not communicate with the peritoneal cavity.  
Site of rupture—Most common in the anterior or lateral wall.



### MECHANISM OF SPONTANEOUS RUPTURE IN OBSTRUCTED LABOUR.

When advance of the foetus is obstructed, the upper uterine segment gradually becomes more and more retracted, while the lower uterine segment becomes more and more thinned due to stretching. At the junction of the upper and lower uterine segment the retraction or Bandl's ring may be palpable through the abdominal wall. Unless the obstruction is relieved, lower uterine segment becomes too much stretched and ultimately gives way.

#### COMMON TYPES OF RUPTURE.

1. A transverse slit at the posterior aspect of the uterus where it comes against the promontory.
  2. Longitudinal tear extending upwards from the vault of the vagina into the base of the broad ligament.
- The rupture is usually extraperitoneal.

### SYMPTOMS OF THREATENED RUPTURE DURING LABOUR.

- i. The contractions become very frequent or sometimes tonic.
- ii. Retraction ring may be felt about 1½" above the pubis.
- iii. Uterus is tender.
- iv. Round ligaments may be felt as tense cords.
- v. Increased rate of pulse and respiration.

#### Signs and symptoms of rupture.

Following long and tedious labour, suddenly at the height of a contraction the patient shrieks out and complains of acute pain in the lower abdomen.

Symptoms of shock, hæmorrhage and collapse soon appear. The face becomes pale, cold clammy perspiration on the forehead, pulse becomes thready.

In some cases rupture may occur very gradually with signs of gradual collapse.

Usually there is not much external hæmorrhage.

Foetus may escape into the peritoneal cavity.

Sometimes the rupture is discovered after delivery of the child. It may be the cause of death shortly after child-birth, which is attributed to obstetric shock; but in reality is due to undiagnosed rupture of the uterus.

#### Differential diagnosis.

##### CONCEALED ACCIDENTAL HÆMORRHAGE,

- i. Uterus increases in size.
- ii. Rarely occurs in the second stage of labour.
- iii. No recession of the presenting part.
- iv. If the foetus escapes into the peritoneal cavity after rupture, the foetal parts are extraordinarily easily palpable.

#### Prognosis.

Very grave

Death is generally due to shock, hæmorrhage or sepsis.

## Treatment.

### PROPHYLACTIC TREATMENT.

- A. Remove the obstruction, by proper treatment of the cause.
- B. Empty the uterus as soon as possible, when signs of threatened rupture appear or the uterus is in tonic contraction.

### TREATMENT AFTER RUPTURE.

#### I. GENERAL.

Treat the shock and hæmorrhage.

- i. Saline or blood transfusion or glucose or gum Arabic solution intravenously.
- ii. Warmth.
- iii. Morphia.

#### II. CHILD.

- (a) Child in the uterus,
  - i. Head presentation.
    - Living—Forceps.
    - Dead—Forceps unfavourable—Perforation.
  - ii. Breech presentation—Perforate the after-coming head if necessary.
  - iii. Transverse presentation—Decapitation.
    - After delivery of the child, remove the placenta manually, otherwise it may escape into the peritoneal cavity.
- (b) Child in the abdomen—Laparotomy.
- (c) Child has partially escaped into the peritoneal cavity through the rent.
  - Deliver per vaginam, if possible.
    - i. Perforate or decapitate the head if necessary.
      - Advantage—Does not carry infection into the peritoneal cavity.
    - ii. Laparotomy,
      - If the shoulders are beyond the tear.
      - Os is too small for safe delivery.

#### III. TREATMENT OF THE UTERUS.

Incomplete rupture—Plug the uterus and give injection of pituitrin or some preparation of ergot. Plug tightly if hæmorrhage is severe. But loose plugging gives better drainage.

Complete rupture—Laparotomy and then pan-hysterectomy, best in our opinion.

If the cervix is left behind, there is always danger of infection as it is nearly always infected through repeated examinations and may later slough.

Proper suturing of the rent is extremely difficult. The edges must be in apposition.

Lightly packing the rent after first pushing the gauze down to the cervix and vagina and then draining through the posterior fornix is the best for an inexperienced obstetrician.

If the case is seen in an outlying district.

Plug the uterus and give injection of pituitrin and do posterior colpotomy. Plugging is removed after 48 hours.

If abdominal viscera are protruding through the rent.

Clean them with sterile saline.

Replace them in the peritoneal cavity.

Plug the rent.

Drain through the posterior fornix.

Keep the patient in Fowler's position.

IV. TREATMENT OF RUPTURE OF CERVIX—Suture the wound.

V. TREATMENT OF RUPTURE INTO THE BROAD LIGAMENT—Douche the uterus and pack the rent firmly with iodoform gauze. Packing is removed after 24 hours and fresh packing introduced.

### ACUTE INVERSION OF UTERUS.

**Definition**—Body of the uterus is more or less completely turned inside out.

Usually it is complete; not uncommon in tropics.

#### Causes.

##### A. SPONTANEOUS.

1. Part of the uterine wall becomes relaxed; this is grasped and carried down by a contraction of the rest of the uterus.
2. Passive sinking of the relaxed fundus into the dilated lower uterine segment e.g. by a fibroid.
3. Short cord being dragged during delivery, pulls down the part of the uterus where the placenta is attached.
4. Expulsive efforts on the part of the mother may push the fundus down.
5. Active contractions of the fundus alone while the rest of the uterus is relaxed, e.g., precipitate labour.

##### B. TRAUMATIC.

1. Injudicious attempts at expression of placenta.
2. Pulling on the cord.

#### Symptoms.

Shock, due to acute constriction of the ovaries and broad ligament, hæmorrhage and pain.

Faintness, rising pulse rate and vomiting.

#### Signs.

##### ABDOMINAL EXAMINATION.

Fundus absent from its normal position.

A flat topped mass or sometimes an actual cup shaped depression may be felt just above the symphysis pubis.

##### VAGINAL EXAMINATION.

A rounded swelling may be seen or felt.

Cervix cannot be distinguished.

**Prognosis.**

Always grave. Mortality in India 30 per cent.

Mortality in untreated cases—70 per cent.

**Differential diagnosis.**

Uterine polyp—Fundus of the uterus will be in normal position.

Sound will demonstrate the uterine cavity and its length.

**Treatment.**

Treat the hæmorrhage and shock first, and then the uterus.

IF HÆMORRHAGE is present—Give morphia and pituitrin into the inverted uterus.

If the placenta is still attached—Remove the placenta and bathe the parts with hot saline.

Raise the foot end of the bed.

Note—Spontaneous restitution or regression of the uterus may occur. We have seen this twice and others have recorded likewise.

IF NO HÆMORRHAGE—Treat the shock. Morphia, saline and warmth.

WHEN SHOCK IS OVERCOME—Treat the uterus.

Squeeze the fundus up under general anæsthetic, with the hand in the vagina.

When reduced—Give a hot (intra-uterine) iodine douche, and an injection of 1 c.c. of pituitrin.

WHEN THE CONDITION IS DISCOVERED A FEW DAYS AFTER LABOUR.

If the uterus is gangrenous and septic—Vaginal hysterectomy.

Failing above—Give hot vaginal douche. Raise foot of bed.

Plug with glycerine daily. After a few days try and replace. It is possible that nature will replace.

If it fails—Wait till involution is complete and then insert Aveling's repositor or a hydrostatic bag to apply continuous pressure.

Failing above—Abdomen is opened and incision is made in the posterior part of the obstructing ring. The uterus is then replaced by an assistant pressing the inverted uterus upwards from the vagina. The uterine incision is then closed in the same way as after Cæsarean section.

**LACERATIONS OF THE PERINEUM.****Three degrees.**

FIRST DEGREE—Involves the anterior part of perineum and posterior wall of the vagina.

SECOND DEGREE The tear passes through the perineal body, reaches up to the Sphincter ani, involving the Levator ani and the posterior vaginal wall. The sphincter itself remains intact.

THIRD DEGREE—Involves tear of the Sphincter ani and may extend an inch or more up the rectum.

**CONCEALED RUPTURE OF PERINEUM**—The skin of the perineum remains intact but the tissues deep to it give way.

**CENTRAL TEAR OF THE PERINEUM**—A tear through the centre of the perineum, between the vagina and rectum, through which the child is born. Not very uncommon in precipitate labour.

#### **Causes.**

##### **I. MATERNAL.**

- i. Primiparity.
- ii. Vulva smaller than normal.
- iii. Perineum repaired in previous confinement.
- iv. Early rupture of the membranes.
- v. Generally contracted pelvis. The head begins to extend too early, before the occiput can escape under the pubic arch.
- vi. Precipitate labour.

**II. FŒTAL**—Malposition, *e.g.*, occipito-posterior presentation.

##### **III. FAULTS OF THE ATTENDANT,**

- i. Rough manipulations.
- ii. Allowing the head to extend before the occiput is free under the pubic arch.
- iii. Incomplete anaesthesia in forceps delivery.

#### **Effects.**

1. Haemorrhage.
2. Sepsis.
3. Loss of function *e.g.*, prolapse of the uterus, incontinence.

#### **Treatment.**

##### **PROPHYLACTIC TREATMENT.**

1. Retard the extension of the head until the occiput escapes beneath the symphysis pubis.
2. Rectify malpresentation.
3. Head should never be violently dragged out.
4. Evacuate the bladder and rectum.
5. Ironing the vaginal outlet with 1, 2 or 3 fingers, so as to stretch and dilate perineal and levator muscles. This is most useful.
6. Episiotomy, when the perineum is too much stretched.

##### **CURATIVE TREATMENT.**

Suture all cases of perineal tear.

Good light is absolutely necessary.

The rectum and the sphincter must be stitched very accurately.

In stitching rectum, put the knots on the side of the lumen of the bowel and invert the edges towards the lumen. Use one or two stitches for the Sphincter ani.

Suture the tear, layer by layer in three layers; one for the mucous membrane and adjacent tissues, one for the muscle and fascia and one for the skin. Catgut is used for suturing

the mucous membrane and the deeper tissues and silkworm gut for the skin. Deep stitches must not be tied too tight.

#### AFTER TREATMENT.

1. Patient is propped up (sitting on a ring pillow).
2. She is encouraged to empty the bladder naturally.
3. The wound should be kept dry, but swabbed with hydrogen peroxide diluted with equal part of water after micturition and defæcation.
4. Liquid paraffin one ounce daily.
5. In cases of complete rupture, the bowels should be kept confined for three days with opium mixture. At the end of third day one ounce of castor oil should be given by the mouth and about 4 ounces of olive oil as enema. When the patient expects the motion, a cocaine suppository may be given.

#### INJURIES OF THE VAGINA.

1. Lacerations—Generally caused by attempts to rotate the foetal head with forceps.
2. Sloughing of the anterior or posterior wall and formation of vesico-vaginal or recto-vaginal fistula.
3. Injuries caused by spicules of bone in craniotomy.

TREATMENT—Tears high up in the vagina may not require suturing, but those in the lower part, involving the Levator ani must be stitched in the same way as perineal tears.

#### INJURIES OF THE CERVIX AND THE PARACERVICAL CONNECTIVE TISSUE.

Severe laceration may be caused by dragging the presenting part through an incompletely dilated os, rapid instrumental dilatation and precipitate labour. The normal (right lateral) obliquity of the uterus pushes the head towards left side. Therefore lacerations of the cervix are more common on the left side.

DANGERS—Hæmorrhage, sepsis and loss of function (sterility: abortion later).

#### TREATMENT.

The anterior and posterior lips of the cervix should be drawn down with tenaculum forceps and stitched with silkworm gut, the stitches passing through the whole thickness of the cervix.

Tears of the paracervical tissue should also be repaired.

#### HÆMATOMA.

May occur in vulva, vagina or between the layers of the broad ligament. Is common in the tropics and in most cases is due to enormous varicose veins of vulva.

More common in multiparæ.

In the broad ligament, it is generally due to extension of a cervical tear and extravasation of blood. There is marked shock with abnormally small amount of obvious bleeding, pain on the affected side and the uterus pushed towards the opposite side.

#### TREATMENT.

IN THE VULVA AND VAGINA—A small hæmatoma may be left alone.

If increasing in size—Incise and turn the blood clot out. The bleeding point is then secured and the cavity lightly packed.

If septic—Incise and drain.

IN THE BROAD LIGAMENT—Evacuate the blood clot and pack the cavity with gauze soaked in an antiseptic. Leave it for 24 hours and then remove half the packing. The remainder is removed 24 hours later.

### INJURIES OF THE BLADDER AND RECTUM.

Injuries of these viscera are very common, subsequent to long neglected labour in patients with contracted pelvis, osteomalacia etc., in distant villages.

#### Bladder.

VESICO-VAGINAL FISTULA—May be urethro-vaginal, cervico- and utero-vesical fistulæ.

#### CAUSES.

1. May be torn during instrumental delivery.
2. Pressure necrosis followed by sloughing.

SYMPTOMS—Incontinence of urine.

#### TREATMENT.

No attempt should be made to repair the fistula within 3 or 4 months of the injury.

After an interval of about six months, it should be repaired.

Sometimes the fistula heals by itself in the mean time.

Put in a self-retaining catheter to drain the bladder.

Many of these fistulæ, because of bony deformity, atresia, size, and scar tissue are quite inoperable by the vaginal route. In such cases the only treatment is to implant the ureters one at a time into the pelvic colon per abdomen. We have operated successfully on a great number of such.

#### Rectum.

1. It is injured in complete or central rupture of perineum.
2. Recto-vaginal fistula.

#### CAUSES.

- i. Pressure necrosis and sloughing of the posterior wall of the vagina.
- ii. Incomplete suturing or sloughing after complete rupture of perineum.

TREATMENT—Suture under chloroform with an assistant, at once or within 24 hours. If this cannot be done properly the rupture must be sutured in 2 or 3 months' time by an expert.

## CHAPTER VI.

### ANTEPARTUM HÆMORRHAGE

**DEFINITION**—Bleeding from the placental site between the twenty-eighth week of pregnancy and the birth of the child.

**VARIETIES**—Two.

1. **Accidental hæmorrhage**—When bleeding occurs from the site of a normally situated placenta.
2. **Placenta prævia or unavoidable hæmorrhage**—When bleeding occurs from a placenta situated on the lower segment, which may be felt on vaginal examination.

### ACCIDENTAL HÆMORRHAGE.

**TWO VARIETIES,**

- A. **TOXÆMIC**—Caused by some sort of toxæmia. Common in tropics.
- B. **TRULY ACCIDENTAL**—Some of these are due to low implantation of placenta, others to injury, fall or traction on the cord during labour.

**Toxæmic type.**

**ÆTIOLOGY.**

More common in multiparæ and occurs late in pregnancy, *i.e.*, after the thirty-sixth week.

Most patients have albuminuria as they may be suffering from chronic interstitial nephritis. Toxæmia may be due to the nephritic condition.

Young holds that the toxæmia and albuminuria are caused by absorption of the autolytic products of the separated placenta. Hæmorrhage separates the placenta which undergoes necrosis, and the products after absorption cause toxæmia.

The more generally accepted view is that the toxins are formed either in the placenta or in the foetus and these damage the endothelium of the blood vessels in the decidua and those in the substance of the uterine muscle. The damaged vessels rupture and blood escapes.

The amount of blood extravasated depends on the degree of toxæmia. The extravasation of blood causes further separation of placenta. Whether the blood is forced out or not depends on the contractile power of the uterus. If the muscles are too much damaged, the patient may bleed to death without any external (or obvious) bleeding. So the arbitrary division into concealed and revealed varieties is of no practical importance.



**MORBID ANATOMY.**

**UTERUS**—Pale ecchymotic patches of hæmorrhage in the wall of the uterus. Subperitoneal hæmatomata may be present, or the peritoneal covering may rupture and blood may escape into the peritoneal cavity. Hæmorrhage may be seen under the decidua.

*Microscopically,*

Intima of vessels are swollen and some of the vessel walls are ruptured.

Inter- and intra-fascicular hæmorrhage.

Areas of focal necrosis of muscle.

Œdema of the connective tissue and degeneration of the muscle fibres.

**LIVER.**

Enlarged and clay coloured.

Scattered areas of hæmorrhage.

**KIDNEY.**

Œdematous.

Cloudy swellings and necrosis of the cells of the convoluted tubules.

**URINE.**

Albumen.

Hyaline and granular casts.

**HÆMORRHAGES** may be present in other places *e.g.*, pleural cavity, spleen, under the pia mater, under the skin.

**SYMPTOMS.**

The patient has not been feeling well for a day or two previous to the hæmorrhage.

Severe abdominal pain and vomiting.

Tongue coated, no appetite.

**SIGNS.**

Patient looks ill and toxic.

Pallor, out of proportion to the amount of blood lost.

Pulse, more rapid than would be expected for the amount of blood lost.

Respiration—Increased.

Uterus—Woody hard and very tender.

Fœtal parts cannot be distinguished and heart sounds are not audible.

Œdema of the ankles and lower abdomen.

Membranes feel peculiarly tense.

Urine contains albumen; scanty, high coloured.

Blood pressure may be raised.

**DIAGNOSIS.**

Differential diagnosis.

1. **HYDATIDIFORM MOLE.**

Vesicles per vaginam.

Characteristic doughy feel of the uterine wall.

## 2. TONIC CONTRACTION OF UTERUS.

Patient advanced in labour and is getting strong labour pains.

Uterus is not larger than normal, and is not globular but is moulded to the shape of the foetus.

Membranes ruptured.

OTHER CONDITIONS which should be differentiated are,

Ectopic pregnancy, rupture of the uterus and other abdominal catastrophies *e.g.*, ruptured gastric ulcer.

## PROGNOSIS. •

Bad.

Depends on the contractile power of the uterus as revealed by the escape of blood-stained serum or blood per vaginam. Postpartum hæmorrhage.

Sepsis.

Child—Nearly always dead. Fitzgibbon is of opinion that in the early stages the child may be alive but when symptoms of toxæmic hæmorrhage appear, the child is always dead.

## TREATMENT.

FITZGIBBON'S METHOD of treatment.

If the patient is in labour—Allow the labour to progress without any interference.

If the uterus is tense and painful and the patient is in profound collapse—Simply puncture the membranes.

Warmth, saline (ten ounces every three hours) per rectum and plenty of water by the mouth.

Saline with glucose 30 per cent. one pint intravenously, if necessary.

Pituitrin (after delivery) helps to stop postpartum hæmorrhage.

Plugging the vagina or Cæsarean section is very dangerous and mortality from any of these is very high.

## VAGINAL PLUGGING.

Twedy believed that it acted by exerting pressure on the uterine arteries and thereby stopped bleeding but we do not accept this; nor permit this treatment to be adopted.

The plugging may raise the intra-uterine pressure and may thus stop the bleeding, but introduces added risk of sepsis and to be done properly demands an anæsthetic. During twenty years, we have never yet seen a patient arrive in hospital properly plugged by a practitioner.

## OTHER METHODS of treatment.

Outline the fundus of the uterus by pencil. This will enable to judge if the uterus is enlarging.

Rest, morphia and warmth.

Saline or blood transfusion.

Plug the vagina tightly, apply an abdominal binder and fix the plugging with a tight T-bandage.

If the patient improves—Rupture the membranes.

If she does not improve—It is dangerous to perforate the membranes.

Although operative treatment under these conditions has a very high mortality that is the only chance of saving the patient, so Cæsarean section with or without hysterectomy should be done.

If the surface of the uterus appears normal and it contracts after removal of the child—Cæsarean section.

Mortality 25 per cent.

Indications for hysterectomy after Cæsarean section,

1. Obvious extravasation of blood under the peritoneum or into the muscle of the uterus.
2. Uterus does not contract after removal of the child.
3. Extensive hæmatoma in the broad ligament.

Mortality of Cæsarean section with hysterectomy, 60 per cent.

Note—The Eden treatment for years has been that of Fitzgibbon and when the general condition has improved, if there is no sign of delivery being accomplished per vaginam, then Cæsarean or hysterectomy is performed. We do not advise plugging as the risk of sepsis from plugging is enormous in the tropics.

## B. Truly Accidental Type of Accidental Hæmorrhage.

The placenta may be situated in the lower uterine segment but cannot be felt with the finger.

### SIGNS AND SYMPTOMS.

There may not be any symptoms apart from the loss of blood. No œdema or albuminuria.

A laminated clot may be expelled showing that there has been a series of small hæmorrhages.

Bleeding may be mild or severe, but there is no sign of toxæmia.

A form of mild hæmorrhage may be associated with toxæmia or even eclampsia.

### TREATMENT.

#### MILD CASES,

Same treatment as in case of threatened abortion.

Rest, sedatives; avoid purgatives and douches.

Keep the patient in bed for 7 days after the bleeding has stopped.

#### MODERATE CASES.

Where the bleeding though not severe enough to threaten life is too copious to justify temporising.

Patient not in labour,

Rupture the membranes and give very hot saline douche.

Give 1 c.c. of pituitrin into muscle.

Apply tight binder. Be prepared to treat hæmorrhage with intravenous 25 per cent. glucose or direct transfusion.

Labour has just started,

- Rupture the membranes.  
 Apply binder.  
 Inject pituitrin.  
 Apply volsellum or Willett's forceps with weight extension.  
 Cervix fully dilated,  
 Rupture the membranes.  
 Inject pituitrin.  
 Apply binder.  
 Apply Willett's forceps if necessary; if pains strong  
 ordinary forceps.
- Third stage—Part of the placenta may be adherent and  
 cause postpartum hæmorrhage.

## SEVERE CASES.

Treat the shock.

Cæsarean section with or without hysterectomy if any  
 complication such as contracted pelvis or fibroids.

## PLACENTA PRÆVIA.

DEFINITION—When the placenta is attached to the lower  
 segment.

In these cases bleeding from the placental site is unavoidable  
 as the placenta must become separated when the lower  
 uterine segment is stretched.

## CAUSE OF HÆMORRHAGE.

- (1) During labour or late in pregnancy—The lower uterine  
 segment becomes stretched. The placenta cannot stretch,  
 so it becomes separated and hæmorrhage occurs.
- (2) About the seventh or eighth month—Painless uterine  
 contractions cause slight expansion of the lower uterine  
 segment and thereby separation of the placenta.

FREQUENCY—1 in 300 in tropics.

**Ætiology.**

More common in multiparæ.

Patients usually have borne number of children.

There is often a history of rapid child bearing.

Chronic endometritis is commonly associated.

## THEORIES.

1. The ovum might have been primarily implanted low down  
 in the uterus.

Causes,

- (a) Lack of power of the chorionic villi to implant  
 themselves at the normal site.
  - (b) The decidua may be unsuitable for implantation  
 owing to chronic inflammation.
  - (c) Late development of trophoblast—It permits the  
 ovum to be carried well down the uterine cavity  
 before it can embed itself.
2. The decidua capsularis instead of undergoing atrophic  
 changes proliferate and invade the decidua vera of the

lower uterine segment. These villi may form part of the placenta on the lower uterine segment.

### Morbid Anatomy.

Placenta is larger and thinner than normal.

It frequently shows signs of degeneration and infarction.

Marginal insertion of the cord is fairly common.

### Varieties.

1. Central—Placenta covers the internal os completely.
2. Marginal—The edge of the placenta reaches the internal os.
3. Lateral—Placenta is attached to the side of the lower uterine segment and its edge does not reach the internal os. In lateral placenta prævia, if the umbilical cord crosses the internal os, it is called *vasa prævia*.

### Effects.

1. MALPRESENTATION—Engagement of the head is difficult as part of the lower uterine segment is occupied by the placenta.
2. HÆMORRHAGE BEFORE OR DURING LABOUR.
3. PREMATURE LABOUR—Separation of the placenta produces uterine contractions.
4. UTERINE INERTIA DUE TO LOSS OF BLOOD.
5. POSTPARTUM HÆMORRHAGE from uterine inertia and inability of the lower uterine segment to retract properly.
6. SEPSIS.

### Signs and symptoms.

Slight and repeated painless bleeding.

The amount of blood lost at the first hæmorrhage is variable.

Bleeding may not occur for a few days and then recur.

If the hæmorrhage occurs for the first time during the first stage of labour, it is generally excessive.

Anæmia. No albuminuria.

### ABDOMINAL EXAMINATION.

Uterus—No tenderness and the consistency is normal.

Malpresentation is common.

Presenting part is high up.

### VAGINAL EXAMINATION.

Soft spongy mass (the placenta) palpable through the fornices.

Differentiation between placenta and blood clot.

The placenta is firmer, more fibrous and less friable.

### EFFECT ON LABOUR.

Labour is very slow and tedious,

1. The normal bag of membranes is not present to dilate the cervix.
2. After rupture of the membranes, the effect of the presenting part in exciting uterine contractions is lessened by the intervention of placenta.
3. The thickened and vascular lower uterine segment dilates less easily.

4. Loss of blood causes uterine inertia.  
Postpartum hæmorrhage is very common.

### Differential Diagnosis.

#### I. ACCIDENTAL HÆMORRHAGE.

Accidental hæmorrhage.

1. One hæmorrhage which is continuous and progressive. Blood very dark.
2. Toxæmic symptoms, œdema, albuminuria and abdominal pain.
3. Head well engaged in the brim of the pelvis.
4. Uterus tense and "woody hard" (only in concealed hæmorrhage).
5. Fœtal parts can hardly be distinguished (only in concealed hæmorrhage) and fœtus is dead.
6. Os is not usually patulous.
7. Rare in primigravida.

Placenta prævia.

1. Repeated attacks of bleeding at intervals extending over several weeks. Blood bright.
2. No symptoms, painless, causeless hæmorrhage.
3. Head above the brim or malpresentation.
4. Uterus of normal consistency.
5. No difficulty in distinguishing the fœtal parts. Fœtus alive.
6. Os is patulous. Cervix usually admits one finger.
7. Parity of no value.

#### II. HYDATIDIFORM MOLE.

Uterus large than normal.

Discharge of vesicles per vaginam.

- III. OTHER CONDITIONS which may require differentiation are, intravervical carcinoma and flattened polypus.

### Prognosis.

Mortality is high. Dependant upon situation of placenta; taking all cases, in the Eden 15 per cent. maternal mortality.

#### MATERNAL.

Prognosis depends upon,

1. Whether in hospital or private house, hospitalization is essential in our opinion.
  2. Presence or absence of uterine contractions.
  3. The amount of blood lost and whether blood transfusion possible.
  4. Condition of the patient when treatment is started.
- The more central the attachment, graver the prognosis.  
Increased tendency to thrombosis of the iliac veins.  
Death is generally due to,

- i. Sepsis; which is predisposed to by,

(a) Low situation of the placenta and therefore the placental site is more easily approachable by organisms.

(b) Internal manipulations.

- (c) Loss of blood lowers the resistance of the patient.
- (d) Lower uterine segment is more friable and therefore more liable to injury.
- ii. Shock.
- iii. Postpartum hæmorrhage; caused by,
  - (a) Large size of the placental site.
  - (b) Uterine inertia.
  - (c) Low situation of the placenta where retractile power is at a minimum.
  - (d) Laceration of the more vascular cervix.
- iv. Pulmonary embolism. \*

CHILD.—85 per cent. are still born and a majority of the remainder die soon after delivery.

Causes of death,

- i. Prematurity.
- ii. Asphyxia.
- iii. Pressure on the cord.

### Treatment.

It depends on,

- (1) General condition of the patient and necessity of blood transfusion.
- (2) Whether labour has started or not.
- (3) Presence of other complications.

IF THE PATIENT IS IN SEVERE SHOCK,

Rupture membranes: inject pituitrin.

Apply binder, and raise foot of bed.

Rest and warmth.

Morphia.

Rectal or intravenous saline of 25 per cent. glucose.

Hot coffee.

When the patient has recovered from shock, further treatment will depend on the other conditions present.

*Never temporise in a private house.*

### I. CERVIX CLOSED.

Tight vaginal plugging under anæsthetic. This is only possible as a temporary measure, pending removal to hospital and operation (Cæsarean section).

Cæsarean section.

### II. CERVIX PARTIALLY DILATED,

LATERAL.—Rupture the membranes; this usually stops the bleeding.

### OTHERS.

Rupture the membranes and apply Willett's forceps or volsellum.

External version and then bring down a leg.

Advantages over bipolar version,

- i. Less damage to the placenta.
- ii. Less shock.

Failing above—Bipolar version and bring down a leg.

In case of difficulty, the leg may be brought down by catching the foot with bullet forceps; and then leave to Nature with or without weight extension; inject pituitrin.

Maternal mortality—15 per cent.

Fœtal mortality—65 per cent.

Advantages of version,

1. Does not require any special instrument.
2. Child is born without further interference.

Disadvantages of version,

1. Fœtal mortality is higher.
2. It is rather a difficult operation when the os admits only two fingers.

Advantages of using De Ribes' bag (in Europe).

1. Results are slightly better for the child.
2. Acts as a dilator and stimulates pain.
3. Does not come out until the os is fully dilated.
4. Can be easily inserted, with its introducing forceps.

Disadvantages of De Ribes' bag (in tropics).

1. Frequently leaks due to deterioration in a hot climate.
2. Causes laceration of the cervix.
3. More liable to infection.
4. Displaces the presenting part, and oblique lie may result.
5. Expulsion of the bag may be momentarily followed by brisk hæmorrhage.
6. Attendant must be present when the bag is expelled.

### III. CERVIX FULLY DILATED, (very rarely seen).

Rupture the membranes and do internal version.

Head presenting—Forceps, if necessary. There is great risk of injury of the soft lower uterine segment.

Breech presenting—Bring down a leg.

### IV. CÆSAREAN SECTION.

Lately has been advocated by us and often done. Because, Maternal mortality—11 per cent.

Fœtal mortality—7.22 per cent.

Better for both mother and child.

Gives best results in cases of central placenta prævia.

There is practically no bleeding if a fundal McCann uterine incision is made and the surgeon's technique is quick and faultless.

Others advocate Cæsarean section but admit the risks of sepsis, formation of adhesions and rupture of the uterine scar later on and recommend the operation under the following circumstances only,

1. When there is likelihood of difficulty in delivery.
2. Primiparæ.
3. Rigid cervix.
4. Central placenta prævia.
5. When parents are very keen to have a living child.



There are others who are of the opinion that,

- i. Moderate success can be achieved with ordinary methods if the surrounding conditions are as favourable as when Cæsarean section is done.
- ii. The operation is not suitable for ordinary private practice.
- iii. It is too radical a method of treatment for most cases of placenta prævia.

V. WILLETT'S FORCEPS—It is a form of scalp forceps which can be fixed to the scalp. After applying it to the scalp, the head can be pulled down.

Encouraging results have been obtained by fixing the forceps to the scalp and then applying weight extension to it.

The forceps is placed against the scalp of the child, blades are opened and then closed so as to pinch and get a good grip of the scalp. Head is then pulled down and a weight of 6-8 pounds may be attached to it to maintain continuous traction and thereby pressure on the placental site.

**Note**—We have had the best results since we adopted the general principles of

- (1) Rupturing the membrane—when os two fingers dilated.
- (2) Applying Willett's forceps with weight extension.
- (3) Slow delivery.
- (4) Giving intravenously 200 c.c. of 50 per cent. solution of glucose and breast saline.
- (5) Owing to the difficulty of donors and immediate grouping and matching of blood we are rarely able to make use of blood transfusion in hospital cases though it has proved ideal in private European patients.
- (6) If the cervix is not dilated and the fœtus is nearly full term, we find Cæsarean gives the best results with least risk. The operation we advocate is the **fundal** (McCann) incision which is made in an almost bloodless area of the uterine wall.

#### AFTER-TREATMENT.

Saline or blood transfusion.

Morphia.

Warmth.

Foot end of the bed raised.

## CHAPTER VII.

### POSTPARTUM HÆMORRHAGE.

**DEFINITION**—Hæmorrhage of over one pint from the genital tract after the birth of the child.

#### **Varieties.**

I. TRAUMATIC—Due to tears of the cervix, vagina or vulva.

II. ATONIC.

The arteries in the uterine wall are cork screw shaped and take a sinuous course, and the veins have got V-shaped angular bends in their course. Normally hæmorrhage is controlled by contraction of the uterine muscle; the vessels are compressed and kinked and the lumina are occluded.

If the muscle is in atonic condition, the vessels are not compressed and bleeding continues.

#### **Causes.**

##### • I. IMPERFECT RETRACTION.

i. RETENTION OF THE PRODUCTS OF CONCEPTION.

(a) Partially adherent placenta.

(b) Placenta succenturiata.

(c) Hour glass contraction.

ii. ATONY OF THE UTERINE MUSCLE, due to

(a) Prolonged and exhausting labour.

(b) Overdistension of the uterus.

(c) Multiparity and degeneration of the uterine muscle.

(d) Antepartum hæmorrhage, specially placenta prævia.

(e) Deep anæsthesia.

(f) Debilitated condition of the mother.

iii. FIBROIDS.

2. LACERATIONS.

3. INVERSION OF THE UTERUS.

4. CERTAIN BLOOD DISEASES, *e.g.*, purpura, anæmia, jaundice.

In atonic hæmorrhage as the uterus is not contracting, the bleeding is always intra-uterine to start with.

**Fibroids,**

Mechanical interference with uterine contractions.

A submucous fibroid may be extruded during labour and cause hæmorrhage.

Lacerations may involve one of the larger branches of the uterine artery or vein.

Diagnosis can only be made by seeing the bleeding point. Pass a speculum, grasp the cervix with sponge forceps and bring it well down.

Varicose veins of the vulva may be torn.

### Diagnosis.

Differential diagnosis.

Inversion of the uterus,

Uterus is inverted.

There is more shock than hæmorrhage.

### Prognosis.

Depends upon

- i. Rate of bleeding.
- ii. Amount of blood lost.
- iii. Previous condition of the patient. This is very important in tropics.
- iv. Sepsis due to intra-uterine manipulations and lowered resistance caused by loss of blood.

### Treatment.

#### PROPHYLACTIC.

1. If there is a history of postpartum hæmorrhage in previous labours—Calcium lactate 10 grains three times a day, every alternate day during the last month of pregnancy. Stop for a few days after two weeks, and then continue for another 10 days.
2. In the tropics where the general musculature is poor and abdominal, uterine and cardiac muscles are often flabby, we are convinced that great benefit is gained by every such patient taking 5 grains of quinine a day during the last six weeks, as this raises the contractibility and retractibility of the uterine muscles and so lessens the risk of P.P.H. and obstetric shock.
3. Manual control of the uterus in the third stage.
4. Arrest of antepartum hæmorrhage as soon as possible.
5. If the uterus shows signs of impending exhaustion, labour should be assisted and the patient delivered. Whereas, when the uterus is actually exhausted, it is a blunder to deliver the patient.
6. Pituitrin is very useful for arresting the hæmorrhage.
7. Always be in readiness to deal with postpartum hæmorrhage while engaged in conduction of labour. Hypodermic syringe, douche, plenty of boiling water, gloves etc.

#### CURATIVE.

##### I. ATONIC.

Very severe hæmorrhage—Press the abdominal aorta with the closed fist of the left hand (standing on a small stool and exerting the body weight on the straightened arm). Ask the nurse to clean your right gloved hand and then remove the placenta manually with the right hand, if not already expelled, and apply bimanual

compression of the uterus. Then give a hot intra-uterine douche at a temperature of about 120° F.

**In lesser hæmorrhage**

1. Massage the fundus with the left hand.
2. Express the placenta by squeezing it out of the uterus. *Vide* p. 198.
3. Hypodermic injection of *ernutin* or *pituitrin*.
4. Grasp the uterus, pull it up and then anteflex it over the pubis. (Hendry's method of stopping the hæmorrhage).
5. Give a hot vaginal douche.
6. If the placenta is still attached—Remove it manually.
7. If the bleeding still continues—Place the closed fist of the right hand in the anterior fornix and compress the uterus bimanually between the external hand (on the abdomen) and the hand inside the vagina.
8. If the bleeding does not stop—Remove the fragments of placenta inside the uterus with a piece of gauge or sponge holding forceps and give intra-uterine douche at 120°.
9. Failing above—Plug the uterus tightly with iodoform gauze. This is very rarely required.

**AFTER-TREATMENT.**

Treat the shock.

Warmth.

Fluids—Saline rectally or intravenously.

Or whole blood transfusion.

Foot end of the bed raised.

Limbs bandaged, to divert the blood from the limbs to the more vital structures.

In bandaging the limbs, start from the part farthest from the trunk and go up towards the trunk so as to squeeze the blood from the limbs towards the trunk.

Liberal diet and tonics during puerperium.

**II. LACERATIONS OF THE GENITAL CANAL.**

Suture the tear.

Pull the cervix well down and tie the bleeding point.

If it is not possible to tie the vessel due to extensive bruising of the tissues—Clamp the bleeding point with artery forceps and leave it there for 48 hours.

**III. FIBROIDS,**

The bleeding usually ceases when uterus is empty.

If it does not stop—Plug the uterus.

Failing above—Hysterectomy may be needed.

**SECONDARY POSTPARTUM HÆMORRHAGE.**

**DEFINITION**—Bleeding from the uterus six or more hours after the completion of labour.

**Causes.**

1. Mental shock.
2. Retained portions of placenta.
3. Backward displacement of the uterus.
4. Extrusion of myoma.
5. Delayed involution.
6. Separation of thrombi due to rise of blood pressure or infection.

**Treatment.**

Treat according to the cause.

If the hæmorrhage is slight,

Inject ernutin.

Hot douche.

Express the clots.

Rest in bed.

If a piece of the placenta has been left behind—Remove it with fingers, or spongeholding forceps. But be sure uterus is empty and then give a hot intra-uterine douche.

If any recurrence, adopt Hobbs' glycerine treatment, tying the catheter to the cervix and injecting 2—3 ounces of sterile glycerine B.D. Ergot should be given for some days.

Extrusion of myoma,

Hot douche.

Ergot.

Failing above—Myomectomy or even hysterotomy.

Backward displacement of the uterus—Replacement and pessary. But of course this could not occur or cause bleeding before the 8—10th day of the puerperium.

## CHAPTER VIII.

### OBSTETRIC SHOCK.

Very common in tropics.

Two different types,

**PRIMARY SHOCK** is of traumatic origin and due to afferent impulses causing reflex vaso-dilatation in the skeletal muscles and consequently marked fall in blood pressure. This condition is seen in rupture of the uterus, inversion, sudden emptying of the uterus, severe laceration of the vagina or pelvic floor.

**SECONDARY SHOCK** is the result of the cumulative action of histamine or some closely allied toxic substance which is liberated from crushed and damaged tissues and causes wide spread relaxation of skeletal capillaries and constriction of the pulmonary arteries and hepatic veins. This type is the most common and the most fatal. For the toxic substance increases the permeability of the capillary walls and so produces a reduction of blood volume especially in the brain.

**PREDISPOSING CAUSES OF SHOCK IN TROPICS.**

1. Hæmorrhage.
2. Prolonged muscular (uterine) exertion.
3. Prolonged chloroform anæsthesia.
4. Prolonged deprivation of fluids and carbohydrates.
5. Sepsis.
6. Mild or severe toxæmia.
7. Exposure and emotional disturbance such as fear, anxiety, and pain.
8. Dropping blood pressure.

#### TREATMENT

In every case, all endeavour should be made to anticipate catastrophe by not only dealing scientifically with the conduct of the case but by recording the blood pressure in all cases in which such an accident may occur. If the blood pressure falls below 100 before the baby is delivered, it is very probable that obstetric shock will supervene in the course of a few hours or minutes. Therefore anticipate or treat it by,

1. Warmth.
  2. Breast or intravenous saline and glucose 30 per cent. solution.
  3. Hot drinks or water saturated with glucose or honey.
  4. Scopolamine, three half hourly injections of 1/100th grain before child is born or pituitrin, morphia and tight abdominal pad and binder after child birth.
  5. Oxygen and open ether anæsthesia when needed.
  6. Tight abdominal binder over a hard pad or sand bag.
- Under no circumstances should suture operations be done or the placenta be removed manually, if no bleeding, until later, when all risk of shock has passed.

## CHAPTER IX.

### DELAYED DELIVERY OF PLACENTA.

Normally the placenta is expelled about 20 minutes after the birth of the child. If it is not expelled within one hour after the birth of the child, it is considered to be pathological.

#### Signs of separation of placenta.

The uterus rises, becomes smaller, harder and more mobile. Cord lengthens.

Slight hæmorrhage from the vagina.

#### Causes of retention of placenta.

##### 1. UTERINE INERTIA.

There is less diminution in the size of the placental site, so the placenta is not detached.

Partial separation leads to hæmorrhage.

##### 2. MORBID ADHESION of placenta.

Normally the placenta separates through the ampullary layer of the decidua. In some cases it is not formed or the decidua basalis may be absent altogether and the villi are directly attached to the muscle of the uterus.

Placenta Accreta, *vide* p. 78.

##### 3. HOUR GLASS CONTRACTION OR CONTRACTION RING.

*Causes,*

(a) Prolonged labour and intra-uterine manipulations.

(b) Administration of ergot or pituitrin.

It can only be diagnosed by internal examination.

##### 4. RUPTURE OF THE UTERUS—Placenta may escape into the peritoneal cavity.

#### Treatment.

If associated with bleeding—Treat as for postpartum hæmorrhage.

If there is no hæmorrhage,

i. Placenta merely lying in the vagina—Massage the uterus with the fingers and thumb; when it contracts, push it downwards and backwards. This will expel the placenta from the vagina.

ii. If the placenta is still in the uterus—Grasp the uterus during a contraction with both hands with the thumbs in front and fingers behind (through the abdominal wall) and squeeze out the contents, until the placenta is felt to leave its cavity. It may have to be repeated several times (under anæsthesia if necessary). If this fails to separate the placenta, it should be presumed that either morbid adhesion or hour glass contraction is present and the placenta will need manual removal.

**Note**—Manual removal of the placenta causes a great deal of shock and there is very grave risk of sepsis.

So every effort should be made to avoid it if possible.

- iii. If the placenta is retained or adherent and the patient is **not** bleeding but suffering from shock, do not interfere if need be for 24—36 hours. Treat the shock with morphia, warmth, intravenous saline, glucose or blood, raising the foot of the bed etc. and then, when sufficiently out of danger attempt to express the placenta and failing this perform manual removal under a carefully administered anæsthetic.

- iv. Manual removal of placenta.

Strict aseptic precautions must be observed. Give chloroform.

Insert (gloved) right hand into the uterine cavity, and press the uterus down on to the internal hand, by the left hand through the abdominal wall.

If a contraction ring is present—Dilate it by steady pressure of the fingers.

If the placenta is detached at any part, start the separation from that region by seesaw movement of the fingers between the placenta and the uterine wall.

If there is no separation at all—Start at the upper edge and work downwards

It may have to be separated in pieces.

Give a hot intra-uterine douche when the operation is finished.

Dangers,

- (1) Sepsis. The large blood sinuses, if infected cause severe septicæmia
- (2) Perforation of the uterus.
- (3) Shock.
- (4) Embolism.

### **Puerperium.**

As there is very great risk of infection, after manual removal we give 2 c.c. of nucleic acid subcutaneously, or 10 c.c. of sterile milk or 30 c.c. of antistreptococcal polyvalent serum.

Ergot should be given in puerperium.

## **RETENTION OF THE MEMBRANES.**

### **CAUSES,**

- (1) Hurrying the third stage of labour.
- (2) Morbid adhesions.

### **TREATMENT.**

If the membrane can be felt hanging inside the vagina—Clamp it with a pair of artery forceps and pull it out gently and steadily.

If it cannot be felt inside the vagina—Leave it alone. It will be discharged with lochia.

If signs of decomposition or sepsis appear—Explore the uterus under an anæsthetic, using fingers or sponge holding forceps.



## CHAPTER X.

# TUMOURS COMPLICATING LABOUR.

## OVARIAN TUMOUR.

### EFFECTS OF THE TUMOUR ON LABOUR,

1. Malpresentation.
2. Diminished effectiveness of pain and increased length of labour.
3. Obliquity of the uterus.
4. Obstructed labour and its consequences; the effects depend on,
  - i. Size of the tumour.
  - ii. Position of the tumour.
  - iii. Whether the tumour is solid or cystic.

### EFFECTS OF LABOUR ON THE TUMOUR.

1. Torsion.
2. Rupture.
3. Expulsion through the pouch of Douglas.

### Treatment.

WHEN THE TUMOUR IS ABOVE THE PRESENTING PART  
—Do not interfere unless any of the complications mentioned above are present.

WHEN THE TUMOUR IS BELOW THE PRESENTING PART.

1. Ideal treatment.

Abdominal ovariectomy near the end of the first stage of labour, and then delivery with the help of forceps per vaginam. This is rarely feasible.

2. If the labour has just started and the cervix is not dilated  
—Cæsarean section after removal of the tumour.

In some cases where adhesions are present, Cæsarean section has to be done first and then the tumour is removed.

3. If skilled assistance is not available,

- (a) Push the tumour up or puncture it. The child is then delivered with forceps or by breech traction. If the tumour bursts it is removed after delivery.

Dangers,

- i. Torsion of pedicle.
- ii. Rupture of the tumour and hæmorrhage.
- iii. Injury to the tumour.

- (b) If the tumour cannot be pushed up,  
Incise it through the vagina.

Child is delivered with forceps.

Remove the tumour after delivery.

- (c) If the tumour is solid—Craniotomy.

## **FIBROIDS OF THE UTERUS COMPLICATING LABOUR.**

### **EFFECTS OF FIBROID ON LABOUR.**

1. Malpresentation
2. Obstructed labour and its consequences; the effects depend on,
  - i. Size of the tumour.
  - ii. Position of the tumour in the uterus.
  - iii. Situation of the tumour in the pelvis.
3. Inversion of uterus.
4. Postpartum hæmorrhage.

### **EFFECTS OF LABOUR ON THE FIBROID,**

1. Laceration.
2. Extrusion.
3. Involution of the uterus is slower.
4. Sepsis.
5. Very occasionally the tumour may disappear after labour by lequifaction and autolysis.

### **Treatment.**

#### **Best treatment.**

Open the abdomen.

Cæsarean section and the tumour dealt with by myomectomy, hysterectomy or ligature and division of the pedicle.

When the above treatment is not possible,

- (1) If the tumour can be pushed up—Push it up and deliver the child with forceps or by breech traction.

## **CANCER OF THE CERVIX COMPLICATING LABOUR.**

### **Treatment.**

#### **CANCER OPERABLE,**

First stage of labour—Cæsarean section and removal of the growth by radical operation.

Second stage of labour,

Child delivered with forceps or better Cæsarean section.

Uterus removed by radical operation.

**CANCER INOPERABLE**—Cæsarean section followed by supra-vaginal hysterectomy (Porro's operation).

**Cancer inoperable and the child is dead**—Craniotomy.

If there is great risk of hæmorrhage due to injury of the cervix—Cæsarean section followed by supra-vaginal hysterectomy (Porro's operation).

## SECTION VI.—THE PUERPERIUM.

### CHAPTER I.

#### NORMAL PUERPERIUM.

**PUERPERIUM**—Period during which the organs and structures that have been changed by pregnancy return to their normal state.

##### **Changes during puerperium.**

I. Changes in the genital tract.

II. Changes in breast.

##### **I. CHANGES IN THE GENITAL TRACT.**

1. **INVOLUTION OF UTERUS**—Gradual diminution of the size of of uterus that occurs during puerperium.

After delivery, uterus reaches about 3" above the symphysis pubis.

It decreases by about  $\frac{1}{4}$ " a day; so that by the ninth day it is about 1" above the symphysis pubis.

The rate of involution is determined by measuring the height of the fundus from the top of the symphysis pubis everyday. It can be recorded on the temperature chart by taking the line representing 100° as the level of symphysis pubis and each degree above it representing 1" above the pubis. Normally the fundus cannot be palpated after the eighth or ninth day.

Precautions to be taken in taking measurement of the height of fundus,

- i. Bladder and rectum are empty.
- ii. There are no blood clots in the uterus.
- iii. There are no fibroids.

##### **Process of involution.**

Obliteration of the blood vessels deprives the uterus of its blood supply.

Excess of protoplasm in the muscle fibres undergoes hyaline degeneration.

There is no diminution of the number of muscles fibres. We believe that the process is one of atrophy which results in the diminution of the bulk of the fibres probably by a process of solution brought about by peptonisation.

The products of autolysis are either discharged with lochia or excreted with urine.

That the muscle fibres undergo fatty degeneration is no longer accepted.

## 2. CHANGES IN THE VESSELS.

The vessels are obliterated by thrombosis and undergo degenerative changes.

In the organising blood clot inside the vessels, new and smaller vessels develop.

Absorption of the old vessels is sometimes incomplete, and when so, they give a characteristic staining reaction.

## 3. UTERINE MUCOSA.

Placenta separates through the spongy layer of the decidua. A portion of the latter remain attached to the uterus.

All but the deeper portions of decidual remnants are cast off with lochia.

New epithelium is then formed from the remnants of the decidua by proliferation of the gland cells and the connective tissue between them. It takes about two months for the process to be complete.

## 4. CERVIX closes down by the end of the first week.

## 5. VAGINA diminishes in size and the folds begin to reappear by the third week.

## II. BREASTS.

First two days there is no milk secretion but colostrum is secreted.

Milk secretion starts from the third day and the breasts become larger, firmer and tender.

## III. CHANGES IN THE ORGANISM.

The apparent enlargement of heart gradually disappears. Temperature—A persistent rise should be regarded as due to sepsis, if no other cause can be found.

Urine.

Quantity is increased for the first three days.

Amount of urea is increased.

Lactose appears in the urine.

Bowel—Generally constipated.

Pelvic joints—The relaxation of the joints caused by pregnancy gradually passes off.

**Clinical aspects of puerperium.****TEMPERATURE.**

MORBID—A case is considered to be morbid if the temperature reaches 100° or over on two occasions between the second and eighth day of puerperium.

PULSE—Usually slower than normal.

LOCHIA—Discharge from the uterus during the first part of puerperium.

In the beginning it is red and is called *lochia rubra*.

It consists of red blood corpuscles, shreds of decidua and small blood clots.

By the third or fourth day it is paler and is called *lochia serosa*. The red blood corpuscles have been diminished in number.

After the tenth day it is whitish and is known as *lochia alba*.

It contains white blood corpuscles and mucus.

If red lochia persists after the second week, it signifies subinvolution.

The amount of lochia discharged is variable. It is increased if the baby is not suckled. It may be altogether suppressed in septicæmia.

The quantity is increased and it may be foul in sapræmia.

Lochia may be retained in retroverted uterus or after Cæsarean section, owing to obstruction to free drainage.

URINE—Traces of albumen and acetone may be present during the first few days.

### MANAGEMENT OF PUERPERIUM.

#### VISITING THE PATIENT,

Following should be noted at each visit,

##### MOTHER.

Temperature.

Pulse.

Respiration.

Abdomen.

Bowel.

Involution of uterus.

Quantity and nature of lochia.

Condition of the breasts and amount of milk secretion.

##### CHILD.

Nourishment and weight.

Condition of the skin.

Condition of the umbilical cord.

Motions.

#### TOILET OF THE VULVA.

Prevent infection.

Lochial discharge is received on clean or antiseptic pads, which must be removed as soon as soiled.

Vulva is swabbed with lysol solution ( $\frac{1}{4}$  drachm of lysol to a pint of water) from above downward, before a fresh pad is applied, and after each motion.

BINDER—Should extend from above the umbilicus down to the level of the trochanters.

#### REST.

Patient should be propped up after 24 hours and head of bed raised.

Patient should be encouraged to be over on her face or in right or left Sims' position for 4-6 hours daily.

Keep her in bed for 14 days.

Massage of the abdomen.

URINATION—Encourage her to pass water within 6-8 hours.

The following will help,

Hot fomentations to the perineum, or ice bag over the pubis.

Hot douches and enemata.

Failing above—Catheterisation.

BOWEL, if constipated—Castor oil or compound liquorice powder; enema, if necessary.

SLEEPLESSNESS.

Cause—Any condition causing pain.

Treatment.

Remove the cause.

Sedatives.

STITCHES—Perineal stitches swabbed with weak antiseptic solution. Removed on the ninth day.

DIET—Milk diet for the first three days. Then fish and eggs for 2 days, which is gradually increased to normal diet.

CARE OF BREASTS—For the first two days breasts secrete only colostrum.

FEEDS.

First day, eight hourly.

Second day, six hourly.

Third day, four hourly.

Three hourly feeding after that. No feeds at night (between 10 P.M. and 6 A.M.).

If both the breasts are used at each feed, the baby should be put for about 7 minutes at each breast.

If only one breast is used at each feed, the breasts should be used alternately. Each feed lasting for about 15 minutes.

Before each feed the nipples should be washed with boric lotion or boiled water.

After each feed, the nipples are wiped with a piece of sterile (boiled) rag, dried and covered with sterilised lint or gauze and the breasts are supported by a binder.

Mother should sit up while feeding the baby.

FINAL EXAMINATION—At the end of the fourth week.

Abdominal muscles. If they are flabby, massage and exercises should be recommended.

Condition of the perineum, vaginal walls and bladder reviewed.

Levator ani—Swedish exercises if the muscle is lax.

Or the patient is asked to contract her Sphincter ani and try to pull up the anus, as if trying to hold back an attack of diarrhoea.

Condition of the cervix—An unrepaired torn cervix always causes leucorrhoea.

Bimanual examination to determine the size and position of the uterus.

REAPPEARANCE OF MENSTRUATION—40 to 73 per cent. of women starts menstruation within three months of the birth of the child in the tropics.

If the baby is not suckled menstruation appears within six to eight weeks.

## CHAPTER II.

# ABNORMALITIES IN PUERPERIUM.

## SUBINVOLUTION OF UTERUS.

### Causes.

#### PREDISPOSING CAUSES.

1. Multiparity.
2. Overdistension of the uterus in pregnancy.
3. Fibroids.
4. Hæmorrhage in labour or anæmia.
5. Not suckling the baby.
6. Cæsarean section.

#### EXCITING CAUSES,

1. Retention of the products of conception.
2. Sapræmia.
3. Pelvic inflammatory lesion.
4. Retroversion.

### Symptoms.

Lochia—Red, increased in quantity and the discharge is prolonged beyond the normal period.

After-pains are usually present.

Uterus is unduly large, soft and often slightly tender.

Cervical canal is patulous.

### Sequelæ.

- i. Retroversion.
- ii. Chronic metritis.

### Treatment.

The patient should be asked to sit up in bed as soon as possible. If the uterus is displaced, it should be replaced and kept in position by pessary.

If any of the products of conception is retained—It must be removed with fingers or sponge forceps.

Vaginal douche, or Hobbs' glycerine treatment.

Drugs—Ergot and calcium.

## AFTER-PAINS.

DEFINITION—Irregular painful uterine contractions in the first 24 hours after delivery.

Generally no definite cause can be found.

More common in multiparæ.

Retention of some of the products of conception may be responsible in certain cases.

**TREATMENT.**

Patient propped up.

Vaginal douche.

Intra-uterine blood clots are expressed by firm pressure.

Hot applications to the abdomen, or ice bag.

Drugs—Ergot and sedatives.

**RETROVERSION OF UTERUS.**

In puerperium the bulky uterus has a tendency to fall backwards.

**CAUSES,**

1. Patient always lying on her back, instead of on her side or face.
2. Laxity of the ligaments.
3. Full bladder.

**SYMPTOMS.**

Increased lochial discharge.

The uterus is often larger than normal.

On vaginal examination, body of the uterus will be found lying backwards.

**TREATMENT.**

Replace the uterus bimanually and then insert a vulcanite ring pessary. It should be worn for three months and the patient told to douche herself daily.

**URINARY COMPLICATIONS.**

I. Retention of urine.

II. Incontinence of urine.

III. Frequency of micturition.

**I. Retention of urine.****CAUSES.**

1. Unusual position (lying in bed).
2. Lax abdominal wall,
  - i. May prevent complete evacuation of the bladder.
  - ii. The patient may not be aware when the bladder is distended.
3. Reflex spasm of the sphincter due to lacerations or stitches in the perineum.
4. Bruising or œdema of urethra.
5. Altered relation of bladder and urethra.

The bladder may become overdistended and cause overflow incontinence.

**TREATMENT.**

1. Let the patient pass water in natural position.
2. Pour sterile warm water over the vulva.
3. Apply a tight binder.
4. Hot fomentations to the perineum if there is any laceration.

Failing above—Pass a catheter with strict aseptic precautions.



**II. Incontinence of urine.****CAUSES,**

1. Cervical lacerations, (generally caused by forceps delivery with insufficiently dilated cervix), may extend up to the bladder.
2. Excessive pressure on the soft part (by the foetal head) may cause sloughing of the bladder wall, and formation of a vesico-vaginal fistula when the slough separates.
3. Overflow incontinence or false incontinence—Retention of urine causes overdistension of the bladder and overflow.
4. Partial incontinence—Caused by injury of the Pubo-cervical muscle. It supports the base of the bladder; therefore when damaged, if the patient coughs, the vesical sphincter is stretched and a few drops of urine are expelled. This is usually associated with cystocele.

**TREATMENT.****FISTULA.**

Put a self-retaining catheter in the bladder. It may heal up if small.

Failing above, it should be repaired about six months after delivery.

**PARTIAL INCONTINENCE.**

Use of pessary often cures the condition.

In some cases anterior colporrhaphy may be required.

**OVERFLOW INCONTINENCE**—Treat the cause of overdistension.

**III. Frequency of micturition.****CAUSE,**

Cystitis. Infection usually follows catheterisation.

Urine is cloudy, contains pus, epithelial cells and bacteria. Tenderness on pressure over the hypogastrium.

Usually the infection is limited to the bladder, but in some cases it may ascend upwards and produce pyelitis or pyelonephritis.

**TREATMENT,**

Keep the patient in bed.

Give plenty of fluids to drink.

Keep the bowels clear.

Give large doses of potassium citrate mixture combined with tinct. hyoscyamus.

Later on, hexamine combined with acid sodium phosphate.

## CHAPTER III.

### PUERPERAL SEPSIS.

After delivery, the placental site is of the nature of a large wound and other wounds *e.g.*, lacerations of cervix, vagina, perineum etc. may also be present. These wounds are very liable to infection. The placental site being full of large blood sinuses, the infection rapidly disseminates through the blood.

#### INFECTING ORGANISM.

**HÆMOLYTIC STREPTOCOCCI**—Commonest organism responsible for the more serious cases.

**BACILLUS COLI**—Commonest organism responsible for mild febrile cases.

#### OTHER ORGANISMS.

*Streptococcus fecalis*, gonococci, scarlet fever strains of streptococci and staphylococci are occasionally found.

- Some authorities maintain that there is a special strain of streptococci which causes puerperal sepsis—"Streptococcus puerperalis" but this is not accepted by most.

**SAPHROPHYTES**—Diphtheroid bacilli are occasionally found, but whether they are primary infecting agents or not cannot be definitely said. These infections are invariably mild.

#### PREDISPOSING CAUSES OF INFECTION.

Any condition which lowers either the general resistance of the patient or the local resistance of the tissues, makes the patient more liable to infection.

#### CONDITIONS WHICH LOWER THE GENERAL RESISTANCE,

Anæmia.

Albuminuria.

Antepartum or postpartum hæmorrhage.

Toxæmias of pregnancy.

Exhaustion from long labour

#### CONDITIONS WHICH LOWER THE LOCAL RESISTANCE OF THE PART.

Devitalised, bruised and torn tissues.

Anything which provides good pabulum for the growth of the organisms *e.g.*, blood clot, retained pieces of placenta, etc.

#### SOURCES OF INFECTION.

##### I. HETEROGENOUS.

When the infection is carried from outside by attendant nurse or doctor.

Generally epidemic cases.

These infections are more serious.

##### II. AUTOGENOUS.

(a) Organisms are already present in the genital canal;

when the general or local resistance is lowered, these organisms get the upper hand and infection occurs.

Generally sporadic cases.

25 per cent. of all serious infections are of this type.

(b) Generalisation of local infection, *e.g.*, infected teeth, tonsils etc.

(c) Coitus in the later months of pregnancy.

Hæmolytic streptococci can only rarely be found in the rectum or vagina. Some authorities maintain that the non-hæmolytic type may change into the hæmolytic form if the environment is favourable, but there is no conclusive evidence to support the statement.

### SPREAD OF INFECTION.

#### PRIMARY FOCI OF INFECTION,

1. Placental site.

2. Tear or laceration in any part of the genital tract.

From the primary focus, infection may spread by

1. DIRECT CONTINUITY OF THE TISSUES.

2. LYMPH,

(a) Salpingitis.

(b) Salpingo-oophoritis.

(c) Tubo-ovarian abscess.

(d) Cellulitis (by the veins as well).

(e) Pelvic peritonitis (along the lumen of the tube and the veins as well).

(f) Thrombophlebitis of the veins of the lower limbs (along the lymphatics or well).

2. BLOOD STREAM—Causing septicæmia and pyæmia.

Four main groups of veins through which it may spread,  
1. Ovarian veins—Most important, as they drain the placental site.

2. Uterine veins.

3. Vesicovaginal plexus.

4. Rectovaginal plexus.

When clinical symptoms of severe infection appear, the organisms are deeply placed in the veins or lymphatics. So local treatment such as douching, curetting, application of antiseptics etc. cannot produce any good effect whatsoever. On the other hand, by disturbing the protective leucocytic barrier, it may disseminate the infection. Whether septicæmia occurs or not depends upon,

i. Virulence of the infecting organism.

ii. Degree of original infection.

iii. Local condition of the site of infection.

iv. Defensive powers of the patient *e.g.*, if the leucocytes are deficient in number or potency, septicæmia is liable to occur. In severe infection, the leucocytes are in a condition of toxic paralysis.

**Morbid anatomy.****I. LOCALISED INFECTION.****UTERUS,**

Large and soft.

Contains slough.

Lochia—Purulent.

**MICROSCOPICAL EXAMINATION.**

Superficial layer of necrotic tissue.

Deeper layer of thickly packed leucocytes and a few organisms—The protective barrier.

Deepest layer—Congested tissue containing no organisms.

**II. GENERALISED INFECTION.****UTERUS.**

May not show any reaction.

Soft and only slightly enlarged.

Interior of the uterus may contain a small slough or may be smooth according to the severity of the infection.

Lochia—May be suppressed.

Usually it is not foul smelling.

**MICROSCOPICAL EXAMINATION.**

Superficial layer—Exudate of fibrin containing myriads of organisms specially streptococci.

Deeper layer—Very few leucocytes. No protective barrier.

Plenty of organisms.

Organisms invade the deeper tissues, muscles, veins and lymphatics.

There is no pus formation, as the leucocytes are paralysed.

When pus forms, the prognosis changes for the better.

**INVESTIGATION OF A CASE OF FEVER IN PUERPERIUM.**

In about 50 per cent. of cases of puerperal pyrexia, the fever has no relation to the labour. Therefore every case of fever, should be thoroughly investigated to determine the cause of pyrexia. Careful history of the labour will help.

Common causes of fever during puerperium apart from sepsis in tropics.

1. Malaria.
2. Pyelitis.
3. Hepatitis and amœbiasis.
4. Helminthiasis, particularly round worms and ankylostoma.
5. Inflammation of breast.
6. Typhoid fever.
7. Kala-azar.

When no extraneous cause of the fever can be found, perineum, vagina, size of the uterus and condition of lochia are examined.

An intra-uterine swab and a specimen of blood is taken for culture.

Technique of taking an intra-uterine swab for culture

The patient lies in the left lateral position.

Speculum is inserted in the vagina and cervix is exposed.

The cervix is cleaned with sterile normal saline.

One end of a glass tube, containing a sterile swab (like a piston) on a long wire is then passed into the cervix.

The swab is now pushed into the uterus by the long wire and kept there for a few seconds to absorb the discharge and is then withdrawn inside the glass tube.

The whole tube with the swab in it is then taken out, and bacteriological examinations are carried out.

If immediate examination is not possible the two ends of the tube can be closed with sterile cotton wool and sent to the laboratory.

**BLOOD CULTURE**—About 10 c.c. of blood is withdrawn from a vein and put into a tube containing glucose broth.

It is particularly important in India to bear in mind that the clinical picture of puerperal sepsis may be imitated or obscured by some tropical disease, which possibly has been dormant for months but owing to the disturbance and tax on vitality of child birth, again shows itself. For instance, we have seen a great many cases (both in hospital and private houses) with puerperal symptoms in whom the diagnosis seemed quite easy but in whom some small clinical fact has suggested that error existed or that some tropical disease was superadded; for example, leucopenia suggesting kala-azar or the ever present typhoid fever; mononuclear leucocyte increase pointing to malaria, polymorphonuclear increase associated with tenderness in the liver or appendix region, suggesting hepatitis or amœbiasis; great eosinophilia suggesting helminthiasis; rigors and distension associated with a clean tongue and moderately slow pulse suggesting *B. coli* pyelitis.

Moreover it is good to remember that enlargement of the spleen is no trustworthy indicator in severe tropical puerperal fever. Therefore it is imperative that the obstetrician should have a good training in clinical methods. For, in the tropics it is not sufficient to brand fever after childbirth as puerperal sepsis until a thorough clinical examination, including blood, urine and stool has been made by competent persons.

In Bengal it is surprising to see the number of cases of kala-azar and malaria which recur in the puerperium. But of all diseases of the puerperium in the tropics, we think pyelitis is the most common cause of morbidity.

In the Eden hospital 30 per cent. of our morbidity cases were proved to be due to *B. coli* pyelitis. Pyelitis may occur by direct upward spread of organisms such as *B. coli* or Staphylococci or through the blood and lymph channels.

There are two clinical types of *B. coli* pyelitis.

1. Mild type.

Fever intermittent.

Slight abdominal distension and uterine tenderness.

Clean tongue.

Bright eye.

No anxious expression.

Urine—perhaps no symptoms of disorder: but it is opalescent and contains many pus cells and slight albumen.

Treatment—These cases rapidly get well with concentrated alkalis for 3 days or more and later on with acids (urotropin). We believe that they should have no milk or soup and only lime juice and barley or water, 6 pints at least a day during the period of alkaline treatment; that is, while there is fever.

2. Severe type.

Rigors with abdominal distension and pain in both loins and over the uterus.

Constant high fever.

Tongue clean and eye bright but later delirium and vomiting and may be, suppression of urine and coma.

Urine cloudy, much pus and albumen.

Treatment—is breast saline or intravenous saline repeated 6 hourly. Water and fruit juice and alkalis by mouth. Poultice or cupping to kidneys. Iodine into vein sometimes does good. Vaccines are useless.

### Types of puerperal infection.

I. Sapræmia or local infection of the genital canal.

II. Infection confined to the pelvis.

Cellulitis.

Thrombosis of the veins in the broad ligament.

Pelvic peritonitis.

Thrombophlebitis of the femoral or saphenous veins.

III. GENERALISED INFECTION.

Septicæmia.

Pyæmia.

General peritonitis.

### I. Localised infection or sapræmia.

Commonest form of infection.

Symptoms of mild toxæmia—Temperature and pulse rate are moderately raised.

Uterus is larger than normal and slightly tender.

Lochia—Increased in quantity and offensive.

Unless the broad ligament or peritoneum is affected, it improves spontaneously.

### II. Pelvic infections.

Symptoms appear about the second week of the puerperium. In rare cases about the third week.

i. PELVIC CELLULITIS—Lymphangitis of the pelvic cellular tissue usually on the left side as lacerations of the cervix are more common on this side.

#### SYMPTOMS.

Onset, about the end of first week. Usually lacerations of the cervix are present.

Temperature and pulse rate raised.

Rigor.

Tenderness on one or both sides of the groin.

Vagina is hot and there is a feel of resistance in one of the lateral fornices.

A hard mass can be felt, usually on the left side of the cervix.

When the swelling increases in size, it occupies the iliac fossa.

#### COURSE.

(a) Resolution.

(b) Suppuration occurs in 20 per cent.—The abscess usually points just above the inguinal ligament. Very seldom does it burst into the bladder or rectum. In 80 per cent. the pus contains streptococci.

(c) Chronic induration about the fornices may persist for a long time, even years.

(d) Femoral thrombophlebitis may complicate the condition.

(e) The exudate may track up the broad ligament, along the ureter and thus a swelling may appear in the loin—Remote parametritis.

(f) The exudate may pass through the sciatic foramen to the gluteal region and a sub-gluteal abscess may form.

#### ii. SALPINGO-PERITONITIS.

Usually comes on about the second week.

Pus escapes from the abdominal ostium of the Fallopian tube directly into the peritoneal cavity and leads to pelvic peritonitis.

#### SYMPTOMS.

Pain in the lower abdomen.

Pulse rate and temperature, raised.

Lower abdomen—Tender, tympanitic and rigid.

Localised tenderness—One inch below and external to the umbilicus.

A mass usually develops on one or both sides of the hypogastrium.

Rigidity and tenderness in the hypogastrium.

The pouch of Douglas may be obliterated by adhesions or a localised abscess may occur and point on abdominal wall or in pouch of Douglas. Sometimes these pus foci burst into bladder or bowel and spontaneously heal; at other times fistulae occur and may last for years.

#### iii. THROMBOPHLEBITIS.

##### 1. VEINS OF THE BROAD LIGAMENT.

(a) If accompanied by lymphangitis, it presents the symptomatology of cellulitis.

- (b) Otherwise the following symptoms appear,  
 Repeated rigors and profuse sweats.  
 High temperature. Pulse rate raised.  
 Pain and tenderness in one of the iliac fossæ.  
 Rapid and progressive anæmia: frequently  
 there is leucopenia indicating extreme virulence  
 of infection. Mortality with best  
 treatment 50 per cent.
2. FEMORAL THROMBOSIS.  
 Comes on between the sixteenth and twentieth day  
 after delivery.  
 The wall of the vein is inflamed and thrombosis  
 occurs.  
 When the lymphatics are also involved—Solid œdema  
 of the leg appears (phlegmasia alba dolens).
- SYMPTOMS.  
 Pain and tenderness in course of the vein.  
 Fever.  
 Swelling of the leg—Tense, hard and looks like  
 marble. In mild cases there is soft œdema which  
 pits on pressure.  
 Course—Takes months to recover and may leave  
 some amount of permanent swelling.
3. SUPERFICIAL PHLEBITIS.  
 Inflammation of one of the saphenous veins.  
 Comes on about the second week, usually 7th day.
- SYMPTOMS.  
 Vein—Tender and hard.  
 Skin over it, red.  
 Pain in the region of the calf.  
 Temperature and pulse rate are moderately raised.  
 Resolution, 3-14 days.

### III. Generalised infection.

#### i. SEPTICÆMIA.

Organisms gain entrance into the blood, as a rule streptococci.

##### SYMPTOMS.

Rigor. Progressive anæmia.  
 Temperature and pulse rate are high.  
 Fulminating cases,  
 Symptoms appear early.  
 Rigors. Sore tongue and lips. Albumen and red  
 blood cells in urine.  
 Temperature very high and pulse very fast.  
 Patient looks ill and there may be delirium and  
 intense diarrhœa.  
 Outlook is very grave and the patient may die  
 within a week.

#### ii. PYÆMIA.

Thrombi laden with infective organisms, staphylococci  
 as a rule, or *B. coli*. which gain entrance into the



circulation and produce abscesses at distant parts without causing any general blood infection.

Time of occurrence—End of the first week.

#### SYMPTOMS.

Hectic fever with rigors. High temperature with remissions.

Metastatic abscesses.

Empyema, bronchopneumonia and joint lesions are common but abscesses may appear in any part of the body for many months.

Prognosis depends on the site of the abscess and the resistance of the patient.

#### iii. GENERAL PERITONITIS.

(a) Typical—A pelvic infective lesion may be present and start the peritoneal infection. In these cases all the usual signs and symptoms of peritonitis *e.g.*, abdominal distension, pain etc., are present. Very fatal.

(b) Atypical—No pelvic lesion may be found.

Signs and symptoms,

Fluid in the flanks.

No abdominal rigidity.

Very little pain. Intense diarrhœa.

Vomiting may be absent.

Patient looks very ill. Smoky urine with albumen.

The infective organisms are very virulent, and prognosis is very grave.

#### Prognosis.

Depends much on possibility of any intercurrent tropical disease.

Local infection—Good.

#### Septicæmia,

It is a very serious condition.

Earlier the onset of fever graver the prognosis.

Persistent high fever—More serious than intermittent fever.

Degree of pyrexia—Has no prognostic value.

Pulse rate,

Over 140 per minute, bad.

Below 110 per minute, good.

Rapid respiration indicates involvement of lung.

Blood culture—If the number of streptococci (per cubic centimetre) shows an increase, prognosis is bad.

Albuminuria, progressive anæmia and diarrhœa are very serious conditions.

General peritonitis—Usually fatal. May survive if drained early.

Salpingo-oophoritis—Good if operated on early or if gonococcal.

Pelvic cellulitis—Good.

Thrombosis of the broad ligament veins—55 per cent. recover.

Thrombosis of the femoral vein—Usually recover.  
Some amount of swelling may persist.

### Treatment.

#### I. PROPHYLACTIC.

During pregnancy—Any focus of infection as revealed by antenatal examination should be properly treated. Coitus should be avoided in the last few months of pregnancy.

Every case of labour must be conducted with strict aseptic precaution. All articles to be used, must be sterilised. *Vide* p. 121.

Sterile rubber gloves must be used for all vaginal examinations and internal manipulations.

The patient must be properly cleaned at the commencement of labour. Vulval hairs should be cut short or preferably shaved. An enema should be given before labour.

If a general anaesthetic is required, it must be given by a different person.

Avoid transference of organisms from below by reducing vaginal examinations to minimum. Unnecessary interference must be avoided.

Manual removal of placenta is very liable to cause infection and has a very high morbidity.

Every attendant including doctor and nurse should wear a mask over nose and mouth; for droplet infection by carriers of virulent streptococci has been abundantly proved. The organisms are transmitted by particles of saliva to a bruised cervix and vagina whilst talking etc. during attendance in stages of labour.

Prevent bruising and devitalisation of the soft parts and endeavour to secure an empty and well retracted uterus at the end of labour by careful management.

### Note.

- (1) If from the nature of the labour, one suspects there is a risk of septic complications, we believe in giving 30-60 c.c. of polyvalent antistreptococcal serum, or 10 c.c. of milk or 3 c.c. of nucleic acid by injection into gluteal region at the end of third stage.
- (2) In tropics the urine, blood, faeces of all patients should be examined thoroughly to eliminate chance of malaria, kala-azar, typhoid, *B. coli*, or worms as a cause of fever or the complications of fever during the puerperium.

#### II. TREATMENT OF LOCAL INFECTION.

1. Promote drainage,  
Patient propped up, or raising head of bed.  
Ergot or pituitrin.
2. Rest.

3. Promote the flow of lymph by injecting glycerine into the uterus through a catheter (Hobbs' treatment).

The best way to do this is to place the patient in lithotomy position over edge of the bed. Insert a posterior speculum. Draw down the cervix with sponge forceps on anterior lip and then insert No. 10 rubber catheter and stitch it to cervix using one silkworm gut suture, and inject sterile glycerine t. d. s. Glycerine makes the uterus contract and acts by drainage and exosmosis.

4. Keep the bowels open.

5. Hot vaginal douche under low pressure is useful.

Exploration of the uterus is harmful. But if a piece of placenta is retained, it should be removed with the fingers or sponge holding forceps.

#### SLOUGHING CERVIX,

Paint the cervix with tincture of iodine.

Hot vaginal douche, twice daily.

### III. SEPTICÆMIA.

Increase the resistance of the patient and try to make her as comfortable as possible in verandah or open air.

Careful feeding with easily assimilable foods, eggs, milk, brandy etc. Sedatives, tepid sponging and fresh air. Mouth should be kept clean, and skin kept dry with spirit. Rectal saline, if the patient is very toxic. Vitamine A (the anti-infective vitamine) such as radio-stoleum and adexolin are important adjuvants.

Avoid stagnation of fluids about the injured part and promote the free flow of lymph.

#### REMINGTON HOBBS' GLYCERINE TREATMENT—*Vide supra*.

As septicæmia is always associated with marked ACIDOSIS it is important to give large doses of bicarbonate of soda and potas. citrate by mouth.

#### GORDON LUKER'S TREATMENT is sometimes very helpful.

Inject five grains of quinine bihydrochloride into the buttock every other day for six to ten days. It should be well massaged into the tissues after injection to local necrosis.

We have obtained excellent results by combining the above quinine injections with 30 c.c. of antistreptococcal serum a day for three days together with half to one pint of 30 per cent. glucose or saline intravenously daily. Intravenous injection of 20 to 30 minims of a 2 per cent. aqueous solution of iodine and potassium iodide is given on alternate days, other hygienic and symptomatic treatment being carried out as usual.

#### INJECTION OF ANTISEPTICS into the blood.

Various antiseptics have been used for the purpose but without any beneficial results. Some of them are positively harmful as they injure the white blood corpuscles.

For this reason some authorities object to the injection of quinine and iodine. But we have found benefit from these two.

Neosalvarsan appears to exert a specific action on hæmolytic streptococci. Dose: 0.6 to 0.9 grammes intravenously.

**VACCINES**—The capacity of the patient to produce anti-bacterial substances must be determined before its good effects can be expected. The proper dosage must also be decided. If the blood still possesses the power to produce bactericidal substances, vaccine is indicated, otherwise it is harmful.

**INCREASING THE PHAGOCYTTIC ACTION OF THE LEUCOCYTES.**

Small doses of cinnamom oil by the mouth.

Rubbing collargol ointment on the thigh.

Injection of nucleic acid, or milk.

**SERA.**

Antistreptococcal.

Antidiphtheritic.

Normal horse serum.

Normal human serum.

Anti-scarlatina serum.

Streptococcal antitoxic serum. (Serum produced by immunisation with streptococcal toxins).

All the above different sera have been used with varying results in the hands different people.

**BLOOD TRANSFUSION**—It has been found to be very useful in small repeated 100 c.c. injections.

**IMMUNO-BLOOD TRANSFUSION**—The donor is immunised by an injection of 100,000,000 of staphylococci. Four and half hours later, the blood is drawn, defibrinated and transfused. Citration impairs the antibody producing powers of the blood.

Artificial leucocytosis may be produced in the donor by a preliminary injection of 2½ c.c. of nuclein intramuscularly.

**CONCENTRATED VITAMIN A.**

Encouraging results have been obtained by treatment with concentrated vitamin A e.g. radiostoleum ½—1 drachm 4 hourly.

**OPERATIVE TREATMENT.**

Mild cases will recover without operation.

Serious cases will be killed by operation.

Results of hysterectomy are bad. It is however indicated in the following conditions,

1. Abscess in the wall of the uterus.
2. Sloughing fibroid.
3. Sepsis following rupture of the uterus.

Prior's operation.

Draining the pouch of Douglas by posterior colpotomy.

We have found this very useful in cases when there is a collection of fluid in the pouch of Douglas *e.g.* pus or infected stinking exudate.

#### PYÆMIA.

Metastatic abscesses are treated in the ordinary surgical way. Empyema and abscesses inside joints may be aspirated. Immuno-transfusion and neosalvarsan are useful.

**LIGATURE OF THE OVARIAN VEINS** to block metastasis of the microbes.

Mild cases recover without it in 60 per cent. \*

Serious cases will be killed by the operation, as the veins have to be tied high up. The right vein should be tied behind the duodenum and the left at the point of its entry into the renal vein.

#### GENERAL PERITONITIS.

Laparotomy and drainage. Vaginally and abdominally.

If the tubes are gangrenous—Remove them. Drain as above.

#### PELVIC CELLULITIS.

Hot fomentations, diathermy.

Hot vaginal douches and glycerine tampons, milk injections.

If abscess forms—It is incised parallel to the inguinal ligament and opened by Hilton's method.

Counter-opening may be made through the vaginal wall.

A large drainage tube is put in.

#### FEMORAL THROMBOSIS.

The leg is placed between sand bags and is kept slightly elevated.

If there is pain—Hot fomentations, or repeated cold compresses or application of glycerine and belladonna.

Juice of 3 limes, daily.

#### SALPINGO-OOPHORITIS.

Early cases—If operated on sufficiently early, salpingostomy may be feasible.

Later cases—Salpingectomy.

Dangers of postponing operation for a long time,

i. Patient becomes worse.

ii. Ovaries may be destroyed.

iii. Adhesions may form with the intestines.

iv. Sinus formation.

v. Cellulitis.

vi. Occlusion of the tubes. Sterility.

#### PUERPERAL ULCER.

Foul ulcer caused by an unstitched ruptured perineum or sloughing vagina.

Careful hot vaginal douches of hypertonic saline, four hourly.

**PUERPERAL PSYCHOSES.****Varieties,**

1. Confusional insanity—Generally caused by exhaustion or septic infection. Characterised by confusion or clouding of consciousness.
2. Alternating insanity—Life long tendency to excitement, depression or stupor.
3. Dementia præcox—Includes all varieties of insanity which end in terminal dementia, and from which there is no chance of complete recovery.

**Predisposing factors.**

Physical disease.

Puerperal sepsis.

Eclampsia.

Any form of deep or continuous anxiety *e.g.*, pregnancy in unmarried women.

History of mental disease in the family.

**Prodromal symptoms.**

Sleeplessness.

Refusal of food.

Disliking the baby or husband.

After the prodromal stage patient becomes maniacal.

**Prognosis depends on,****1. TIME OF ONSET.**

During pregnancy, least favourable.

During labour or in puerperium, generally the confusional form of insanity, so outlook is good but alternating insanity is quite common too.

During lactation, usually confusional, therefore prognosis is good.

**2. HISTORY OF PREVIOUS ATTACKS OR A FAMILY HISTORY OF INSANITY—**If positive, it is generally, not the confusional type and so prognosis is unfavourable.**3. PREDOMINANT MENTAL SYMPTOM—**Delirium and stupor are unfavourable.**POSSIBILITY OF RECURRENCE IN FUTURE PREGNANCIES.**

If it is a complication of sepsis or eclampsia—Little likelihood.

Cases where there is a family history of insanity or history of mental trouble in puberty, and all epileptic cases—Great risk of recurrence.

**Treatment.**

Remove the patient (to a hospital or home) from the usual environments. No visitors.

Keep the patient on ground floor under strict supervision.

After labour, take the child away from mother.

Sleeplessness,

Try hygienic treatment first *e.g.*, fresh air, exercise, bowels kept open etc.

Failing above, Bromides, chloral or paraldehyde.

Food—Give plenty of food.

If refused, nasal feeding.

Acute excitement—Morphia gr. 1/6 with hyoscine 1/100; or pernoctan intravenously.

SIGN OF IMPROVEMENT—Weight returns to normal.

INDICATIONS FOR INDUCTION OF ABORTION (it should be done in consultation with an alienist or another doctor).

1. Patient convinced that she will die in labour.
2. Patient had two or more previous pregnancies and became insane during puerperium each time. Abortion should be induced in early months of pregnancy or abdominal hysterotomy with ligation of tubes.

## CHAPTER IV.

# DISEASES OF THE BREAST.

### Engorged breasts.

About the third day, breasts may be engorged with blood.

#### SYMPTOMS.

Slight fever.

Skin over the breast is congested and the veins are prominent.

Breasts are tender, painful, hard and knotty.

Nodules of breast tissue may be felt.

May terminate in abscess formation.

#### TREATMENT.

Hot fomentations.

Supporting bandage.

Gentle massage from periphery towards the nipple.

Breast pump may be used to empty the ducts.

Saline purges.

Child is put to breast.

### Cracked nipples.

#### CAUSES.

Not keeping the nipples clean during pregnancy.

Suckling the child too frequently and for too long.

Child sucking too vigorously generally in cases of retracted nipple.

Thrush and syphilis.

#### SYMPTOMS.

Breast is extremely painful.

Tenderness and pain during suckling.

Slight bleeding may occur while suckling.

Liable to infection and may terminate in abscess formation.

#### TREATMENT.

##### PROPHYLACTIC.

The patient should draw the nipples out towards the end of pregnancy.

All crusts should be removed.

Nipples swabbed with spirit.

Nipple should be cleaned at the end of each feed with 1 in 1000 perchloride of mercury or flavine solution. It must be washed away before the next feed.

##### CURATIVE.

Nipple shield should be used.

Application of tinct. benzoin co.

Fissure may be cauterised with silver nitrate.



**Inflammation of the breast.**

Comes on about the third week of puerperium.

Infection enters through a fissure or crack in the nipple.

Abscess may form

- i. In the subcutaneous tissue—Premammary abscess.
- ii. In the substance of the breast—Intramammary abscess.
- iii. Behind the breast—Retromammary abscess.

**SYMPTOMS.**

Pain in the breast.

Rigor, raised temperature and pulse rate.

Breast, hard, tender and shiny.

When suppurates—Œdema and redness of the skin.

**DIAGNOSIS.**

Differential diagnosis—Encephaloid carcinoma or cancer *en cutasse* (very rare).

- i. Tumour can be felt in the breast.
- ii. No sign of inflammation.
- iii. Absence of pain and tenderness.
- iv. Microscopical examination.

**TREATMENT.**

Cracked nipples should be treated as described above.

Breasts are put at rest, milk being withdrawn by breast pump.

Hot fomentations.

Purgative.

If abscess forms—Incise the abscess in a line radiating from the nipple towards the periphery, under ether anaesthesia. Septa are broken down with finger. A counter-opening may be made at the most dependent spot. Then a large drainage tube is put in. The cavity is dressed daily with hydrogen peroxide.

**Galactocoele.**

Caused by the blockage of a lactiferous duct with the formation of a retention cyst.

TREATMENT—Incision and drainage.

**Galactorrhoea.**

Continuous flow of pale watery milk from the nipple.

The fluid is of very little nutritive value.

Child should be withdrawn from the breast and artificially fed.

**TREATMENT.**

Breasts painted with extract of belladonna and firmly bandaged.

Tinct. belladonna by the mouth.

Purgatives.

X-rays in resistant cases.

**Prevention of lactation.**

This has to be done if the child is still-born or suckling is con-

tra-indicted for any reason.

Wash and powder the breasts.

Cover them with cotton wool and apply a firm bandage.

Fluid drinks should be limited to minimum.

Saline purgatives.

Tinct. belladonna by mouth.

Emplastrum belladonna applied over the breasts.

### **Deficient secretion of milk.**

#### **CAUSES,**

Premature baby.

Mother suffering from some wasting disease.

Elderly primipara.

Feeble child.

#### **TREATMENT,**

Ample and nutritive diet.

Plenty of fluids to drink.

A strong and hungry baby (put to the breast) is the best stimulant of milk secretion.

## CHAPTER V.

# TUMOURS COMPLICATING PUERPERIUM.

### I. Ovarian tumour.

#### EFFECTS OF OVARIAN TUMOUR.

1. It may become infected after being bruised.
2. Peritonitis may be set up from rupture and liberation of the irritating contents.
3. The pedicle is liable to torsion.

#### TREATMENT.

If any of the above complications is present, immediate laparotomy should be done.

In the absence of any complication, removal of the tumour may be postponed for a few weeks.

### II. Fibroids of the uterus.

#### (a) EFFECTS OF PUERPERIUM ON FIBROID.

1. If it becomes infected, the tumour may be discharged piecemeal or suppuration around the capsule may cause its extrusion.
2. Torsion of the pedicle.
3. Necrobiosis. Liquefaction and disappearance (rare).
4. Submucous fibroid may be extruded, being preceded by hæmorrhage and pain.

#### (b) EFFECTS OF FIBROID ON PUERPERIUM.

1. Patient may become septic and very ill as a result of morbid or traumatic changes in the fibroid.
2. After expulsion of the child, the tumour may slip down and become impacted in the pelvis.
3. Secondary postpartum hæmorrhage.
4. Subinvolution of the uterus.
5. Inversion of the uterus.

#### TREATMENT.

Keep a careful watch for the above symptoms.

If septic or undergoes necrobiotic changes—Myomectomy or hysterectomy should be done.

If the tumour is submucous, it may be removed vaginally, but before anything is done or cut away, the nature of the mass must be carefully examined so as to exclude the body of the uterus.

## SECTION VII.—THE NEW BORN CHILD.

### CHAPTER I.

## MANAGEMENT OF THE NEW BORN CHILD.

The stimulus of the cold air on the skin together with the past retraction of the uterus which caused accumulation of carbon dioxide in the blood, stimulates the child to breathe.

MOUTH AND PHARYNX should be carefully cleaned with a piece of gauze wrapped round the little finger.

#### EYES.

Before the child opens the eyes, the eyelids are wiped with boric lotion swabs.

If the mother has any vaginal discharge, 1 per cent. silver nitrate is dropped into the eyes. This is done as a routine in Eden Hospital in any case of doubt or suspicion.

The hands are confined in the wrapper so that the child cannot reinfect the eyes.

#### UMBILICAL CORD.

It is ligatured about 2" from the abdomen, when the cord has ceased pulsating, except in the last few inches. Care should be taken that there is no hernial protrusion included in the ligature. Cut end is painted with iodine.

After washing the child, dust the stump with aseptic powder, cover it with sterile gauze and apply a binder.

It separates about the fifth day.

VERNIX CASEOSA is cleaned by smearing the child with warm olive oil, after the cord is cut.

#### STOOLS.

First few days, dark green and sticky. It is known as meconium and consists of epithelial cells, hairs, and bile pigments.

Three or four motions a day.

Bright yellow colour after the third day.

#### URINE.

Child passes urine soon after birth.

If it does not, and the lower abdomen is distended—Place him in a hot bath keeping the end of the penis out of the water.

Frequently due to spasm, the baby will not pass urine for 24 hours and much alarm arises. An ordinary fine blunt pointed probe is passed with care and micturition occurs shortly afterwards.

Napkins must be changed as soon as they are soiled.

**CLOTHING**—Warm and light.

**BATH.**

Warm bath once a day.

The flexures should be powdered after drying the baby.

**WEIGHT.**

Average weight at birth is 6 pounds.

Usually there is slight loss during the first 4 days, which is regained by the tenth day.

## CHAPTER II.

### BREAST FEEDING.

Breast feeding is best for both the mother and child.

#### Advantages of breast feeding.

1. The child obtains natural food at body temperature without any contamination and with its properties and vitamins unimpaired. It gives the greatest security against intestinal disturbances and infection, which are the commonest troubles with new born babies.
2. Some degree of immunity is passed from the mother to the child.
3. In cow's milk, the protein content is not only more than double than that of human milk, but the proportion of casienogen to soluble protein is 4 : 1 as opposed to 1 : 3 in the human milk.
4. The curd of human milk is thin and flocculent, while that of the cow's milk is firm and tough.
5. Fat emulsion in the human milk is finer.
6. It ensures better and more complete involution of the uterus.
7. The mother gains more intimate knowledge of the infant and its requirements and it certainly produces better physical and psychological effects.

#### Number of feeds.

Eight hourly, first 24 hours (sterile water between the feeds).

Six hourly, second 24 hours.

Four hourly, third day.

Three hourly, fourth day.

At the beginning both breasts are used at each feed, and as the quantity of milk increases, the feed in the second breast is gradually diminished, until only one breast is used at each feed.

Fifteen minutes for each feed. If both the breasts are used for each feed, 7 minutes at each breast.

Mother should drink a glass of water before each feed.

During the first two days, only colostrum is secreted and the baby does not get any milk for these two days. The high protein content of colostrum probably affords the immune bodies.

Composition of milk and colostrum,

			Colostrum.	Milk.
1. Water	...	..	88	88
2. Protein	...	...	3	1.5
3. Fat	...	...	3	3.5
4. Sugar	...	...	5	6.5
5. Salts	...	...	0.4	0.2

**Conditions affecting the composition of milk.**

1. Diet of the mother—Fluids increase the quantity.  
Nitrogenous diet increases the protein and the fat content.
2. Nervous impressions e.g., worry, anxiety—Diminish the quantity.
4. Acute illness—Quantity is diminished.
5. Occurrence of pregnancy—Diminishes the quantity and quality.

**Management of the nursing mother.**

Should lead an equable life.  
Good sleep and rest are highly desirable.  
Diet should contain plenty of green vegetables.  
Plenty of water to drink, 2-3 pints a day.  
Alcoholic drinks are generally harmful.  
Exercises or massage and fresh air are essential.

**Evidence of insufficient breast milk.**

Child is restless, fretful and cries before and after feeds.  
Weight of the child does not increase or it may go down.  
Child is constipated, stools are dry.  
Baby may get inanition fever.

**TEST FEEDS,**

Weighing the child before and after the feed. The difference will indicate the amount of milk taken. The baby must be weighed in the same clothes and must not have passed a motion or urine in the mean time.

**Breast feeding is contraindicated in the following conditions,****MOTHER,**

1. Grave disturbances of nutrition
2. Tuberculosis.
3. Renal disease.
4. Cardiac disease.
5. Insanity.
6. Diabetes.

**CHILD,**

1. Inability to suck.
2. Mother's milk not agreeing with the infant—Very rare.

**BREAST FEEDING SHOULD BE TEMPORARILY STOPPED in the following conditions,**

1. Acute illness of the mother.
2. Cracked nipples.
3. Acute mastitis.
4. Galactorrhœa.

**Causes of deficiency of breast milk.**

1. Grave nutritional disturbances.
2. Deficient development of breasts.
3. Serious organic disease.

4. Anæmia.
5. Depressed or deformed nipple causing pain during suckling.
6. Feeble baby who cannot stimulate mammary secretion by strong suction
7. Psychological effect—Commonest cause. The patient having been told or having got the idea that she is incapable of suckling the baby, does not try to suckle the baby properly. A hungry strong baby is the best stimulant of milk secretion.



## CHAPTER III.

### ARTIFICIAL FEEDING.

When suckling is contraindicated, the baby may be artificially fed or wet nursed.

#### I. Wet nursing.

The nurse should be between the ages of 20 and 35, of good health and free from any disease.

She must have well shaped nipples and plenty of milk.

The babies should be of about the same age.

#### II. Artificial feeding.

Cow's milk, goat's milk, and ass's milk may be used for the purpose.

Cow's milk is most generally used, as it can be most easily obtained. But goat's milk is excellent and can always be procured in India.

Various patent milks prepared by manufacturers may be used when no fresh milk is available or is contraindicated. But they all have vitamin deficiency. Many contain excess of fat which cause either "infantile liver" conditions in the tropics or enteritis. In our opinion they should only be used temporarily. For goats can always be kept or cow's milk obtained. Patent milk foods conduce to rickets unless intelligently used.

Comparison between cow's milk and human milk.

		Cow's milk.	Human milk.
Reaction	...	Acid.	Alkaline.
Specific gravity	...	1029	1032
Protein	...	4	1.5
Fat	...	3	3.5
Sugar	...	4	6.5
Salts	...	0.7	0.2

So in order to make cow's milk of the same proportions as human milk, it needs dilution of the protein and addition of more fat and sugar. The protein of the cow's milk coagulates in firm and heavy curd, so the addition of a little citrate will make the curd finer and more digestible.

#### PREPARATION,

Half a pint of cow's milk.

One heaped table spoonful of sugar of milk.

Half ounce of cream.

Made up to a pint with water and sodium citrate in proportion of one grain to each ounce of the original milk, is added.

**An infant requires  $1\frac{3}{4}$  ounces of milk per pound of body weight per day.** The total amount required is calculated and equally divided for each feed. It also requires  $\frac{1}{4}$  oz. of water per lb. weight per day with milk and one teaspoonful of sugar or Mellin's food per lb. weight per day.

The milk may be sterilised in a Soxhlet apparatus by keeping it at a temperature of  $160^{\circ}\text{F}$ . for 20 minutes.

Remember every bottle-fed baby must be given fruit juice such as orange, pomegranate, grape, tomato, coconut-milk one teaspoonful per lb. weight per day.

### **Methods of rendering the milk free from infection.**

1. Sterilisation.
2. Pasteurisation.
3. Boiling.

#### **1. STERILISATION.**

In dairies this is done by superheated steam.

At home it may be done by immersing the bottle in boiling water for one hour.

It kills all bacteria, but lessens the vitamin content.

- 2. PASTEURISATION—This is done by keeping the milk at a temperature of  $160^{\circ}\text{F}$  for 20 minutes.

It destroys most microbes except a few spore forming organisms.

The vitamins are not affected.

Soxhlet apparatus is the most convenient one to use for the purpose.

3. BOILING—Bringing the milk to boiling point and then cooling it rapidly. If it is not rapidly cooled it forms a good pabulum for the growth of organisms.

Destroys all the organisms but does not destroy the anti-rachitic vitamin.

### **Care of bottle.**

Bottle feeding must be supervised by the nurse or mother.

The bottle should be of the simplest pattern and there must not be any tubing attached to it.

Boat shaped bottles in which the milk comes out by gravity are the best.

The bottle should be so made that when it is inverted, the milk comes out drop by drop per second by gravity.

It must be cleaned with hot water before and after each feed.

The teat and the valve should be removed for the purpose.

It is preferable to use two bottles alternately. They should be kept in sterile water when not in use.

The level of milk in the bottle must be higher than the level of the teat while feeding, so that the child does not swallow any air.

**Difficulties in artificial feeding.****I. CURD INDIGESTION.****CAUSES,**

- i. Feeding the baby on an unsuitable mixture.
- ii. Weak digestive power of the child.

**SYMPTOMS,**

- Wasting.
- Loss of weight.
- Vomiting, colic pains, diarrhoea.

**TREATMENT,**

Correct any error in the milk mixture.

If still no improvement—Feed on whey for 2 days.  
After two days gradually add more and more of citrated milk.

The colic in these cases is best relieved by a warm water enema and then giving some simple carminatives.

**II. FAT INDIGESTION.**

Symptoms—Pale greasy stools.

Treatment—Reduce the amount of fat in the mixture.

This is best done by skimming the milk. Take a small douche can of enamel. Cork up the outlet and boil the milk slowly for 20 minutes. Then set on ice for 2 hours. The fat will rise and occupy the upper  $\frac{1}{3}$  of the milk and lower  $\frac{2}{3}$  will be fat free and may be drained off into a clean vessel by removing the outlet cork. The skim milk may be sweetened with sugar of milk or Mellin's food. At the same time give 1 gr. B. W. tabloid of grey powder (crushed) alternate nights with milk of magnesia and paraffin of each  $\frac{1}{2}$  teaspoonful in the morning.

## CHAPTER IV.

### MANAGEMENT OF PREMATURE BABY.

**PREMATURE BABY**—When the infant is born before the fortieth week of gestation.

#### **Signs of prematurity.**

Weight under  $\frac{1}{2}$  pounds and length less than 20".

Small, drowsy and lifeless.

Movements and crying are very feeble.

Eyes are kept closed.

Head and abdomen are disproportionately large.

Nails do not reach the tip of the toes or fingers.

Fontanelles and sutures are big and wide.

Lower end of femur is not ossified.

Skin bluey purple.

#### **Management.**

Gently rub with warm olive oil. Do not bathe or handle the baby unnecessarily.

Wrap it in cotton wool.

**IN THE TROPICS**—Keep it in a sunny verandah in the sun upto 10-30 A.M. and after 3 P.M.

**IN COLD COUNTRIES**—Keep it in an improvised incubator or maintain warm temperature by placing few hot water bottles. An ordinary screen covered with blankets, makes a fairly good incubator for the purpose. The top should be kept open for ventilation.

**FLUIDS**—They need one fifth of their body weight of water per day. If the whole amount cannot be given by the mouth it may be given subcutaneously with 10 per cent. glucose.

#### **FEEDS.**

First 24 hours,

Top milk or cream diluted 1 in 12 with water. One teaspoonful every hour.

Second day—The cream is diluted 1 in 8 with water.

Third day—Breast feeding.

If the baby is too feeble to suck—The milk is expressed by breast pump and the baby is fed with spoon, pipette or catheter in the mouth.

If breast milk is not available—Use a mixture of whey and cream (1 of cream to 4 of whey), half an ounce every 2 hours at the end of the first week.

After the first week—Mixture of milk and water (1 of milk to 4 of water) gradually increasing strength of mixture with sodium citrate one grain to each ounce.

If the baby is cyanosed—Sunlight, fresh air or oxygen inhalation.

## CHAPTER V.

# ASPHYXIA NEONATORUM.

**DEFINITION**—When the infant fails to breathe after birth.

### Two types.

1. Asphyxia livida or blue asphyxia.
  2. Asphyxia pallida or white asphyxia.
1. ASPHYXIA LIVIDA.

The respiratory function is mainly at fault.

Skin cyanosed.

Heart beat is slow but strong and fairly regular.

Muscles are firm.

Cutaneous reflexes are present.

Pupils are contracted.

2. ASPHYXIA PALLIDA.

Child is suffering from heart failure and foetal shock.

Colour is pale blue, grey or white.

Heart beat is slow, feeble and irregular.

Muscles are flaccid and the reflexes are lost.

Pupils are dilated.

Generally caused by prolonged labour, head injury, breech delivery, prolonged chloroform anaesthesia, forceps.

### Causes.

1. Interference with placental circulation,
  - (a) Pressure on the cord.
  - (b) Premature separation of placenta.
  - (c) Delayed delivery of the after-coming head.
  - (d) Tonic contraction of uterus.
  - (e) Anæmia of mother, as in severe hæmorrhage.
2. Pressure on the brain as in contracted pelvis, forceps delivery.
3. Intracranial injury particularly tearing of the tentorium.
4. Premature inspiratory effort.

### SIGNS OF IMPENDING ASPHYXIA.

1. Foetal heart rate is irregular and may be very fast or very slow.
2. Convulsive movements of the foetus.
3. Passing of meconium in cases other than breech presentation.

### Prognosis.

White asphyxia—Grave.

Blue asphyxia—Readily recovers with proper treatment.

### Treatment.

Clear the mouth and pharynx with a piece of gauze wrapped round the little finger, or with a mucus catheter.

Rub brandy on the gum and chest.

Treatment must be continued as long as the heart beats.

# WHITE ASPHYXIA OR FETAL SHOCK.

Tie the cord and separate the baby.

Handle the baby very gently. Use mucus catheter.

Holding the baby by the feet with a warm towel round the body, immerse baby in a hot bath at a temperature of 112°F. and keep it there for ½ an hour or longer until first cry comes.

Inject 5 minims of adrenalin into heart in 3rd or 4th interspace close to sternum or pituitrin into muscle. **Do not do** artificial respiration: but compress chest with hand under water 10 times a minute, or dilate foreskin and put middle finger into rectum. A mask connected with a cylinder of 5 per cent. carbon dioxide and 95 per cent. oxygen is the best respiratory stimulant: failing this blowing down the mouth expired air has perhaps the same effect. A great many of these babies recover if treated by the above method.

# BLUE ASPHYXIA.

Clear the throat and air passages.

Hold the child by the feet.

Stimulate by slapping the buttocks.

Rub the spine with brandy.

Sprinkle cold water on the face.

Separate the child when pulsation of the cord has stopped.

Failing these, place the child in a warm bath and start artificial respiration.

# Artificial respiration.

1. SYLVESTER'S METHOD—It requires an assistant.

The baby is either placed in a warm bath or wrapped in a blanket, and the head is kept midway between flexion and extension.

An assistant holds the feet.

The operator stands near the head of the baby.

The child's arms and elbows are drawn upwards and outwards and then inwards until the arms touch the side of the head; this causes expansion of the chest. Then the arms are brought down and pressed against the chest; this causes contraction of the chest. These movements should be carried out about 10 times a minute.

2. TONGUE TRACTION—Tongue is grasped with a piece of gauze or tongue forceps and gently pulled out and pushed in. The whole movement should be done about 10 times a minute.
3. BYRD'S METHOD—Grasp the child with the palmar surface of one hand against the buttocks and the other, against the upper part of the back, the extended thumbs supporting the head and the inferior extremities. Then extend and flex the

body of the child alternately, this will cause alternate expansion and contraction of the chest.

Advantage—Can be carried out single handed.

Disadvantage—The movements are too violent for a feeble child and the amount of air breathed in and out is less than in Sylvester's method.

We do not permit Schultze's method of respiration, as we consider it may cause death by intraspinal hæmorrhage or shock.

## CHAPTER VI.

### INJURIES OF THE NEW BORN.

**EXCESSIVE MOULDING**—Too much over-riding of the bones, so that it may tear the tentorium cerebelli or may produce cerebral hæmorrhage by injuring the veins.

**CEPHALHÆMATOMA**—Effusion of blood between the pericranium and skull. In the early stages fluctuation may be elicited. Later, the blood coagulates and presents a hard surrounding edge with a rather soft central part. The hard edge is above the surface of the skull.

#### DIFFERENTIAL DIAGNOSIS.

- i. Depressed fracture of the skull—The edges of the depressed part are not above the surface of the skull.
- ii. Caput succedaneum—Disappears within 24 hours of delivery.

**DEPRESSION OF SKULL**—Caused by the head being pressed against the promontory or by forceps.

The frontal and parietal bones are usually affected.

May be gutter shaped or spoon shaped.

Usually disappears in one week. Surgical elevation is rarely needed.

#### FRACTURE OF THE SKULL.

##### CAUSES.

- i. Forceps delivery.
- ii. Difficult delivery of the after-coming head.

##### SYMPTOMS.

Usually the child is born asphyxiated.

Paralysis is common if the child survives.

Convulsions may occur.

**INTRACRANIAL HÆMORRHAGE**—Due to rupture of the vein of Galen or one of its tributaries or tentorium or falx.

##### CAUSES.

- i. Forceps delivery.
- ii. Contracted pelvis.
- iii. Breech presentation.
- iv. Sometimes it may occur after normal delivery and without any apparent cause.
- v. Precipitate labour.

##### SYMPTOMS.

Recurrent attacks of cyanosis.

Child is drowsy and may be jaundiced. It will not suck.

Twitchings or convulsions may be present.



Anterior fontanelle tense. Neck rigid.

Paralysis may supervene.

Lumbar punctures—Cerebro-spinal fluid blood stained.

## INJURIES OF NERVES.

### FACIAL NERVE.

Caused by the pressure of forceps on the nerve where it crosses the lower jaw.

Usually passes off in a few days.

Active treatment is usually not required. In cases of delayed recovery mild massage and Faradism should be given.

### BRACHIAL PLEXUS—Erb's paralysis.

Causes,

- i. Pressure of forceps on the posterior triangle of the neck.
- ii. Pressure of finger or blunt hook in the axilla.
- iii. Traction on the arm during breech delivery.
- iv. Traction on the head during shoulder delivery.

Duchenne type—Injury of the fifth and sixth cervical nerves only.

Treatment—The arm is kept bandaged to the chest over cotton wool as in the case of fractured humerus for a fortnight.  
*Vide infra.*

### HÆMATOMA OF THE STERNOMASTOID.

Causes.

- i. Traction on the body in the case of after-coming head.
- ii. Traction on the head when the shoulder is impacted in fore-coming head.

The hæmatoma generally disappears in a few weeks.

In some cases fibrosis and contracture of the muscle may produce torticollis.

## OTHER INJURIES.

Fracture of clavicle.

Fracture or separation of epiphysis of humerus or femur.

Fracture of the lower jaw or other facial bones.

Dislocation of joints.

Injury of thoracic or abdominal viscera, *e.g.* liver, adrenals.

Fracture of the upper arm is treated by placing an aluminium strip under the body and gently strapping both upper arms to it so that the baby lies for 2 weeks in the crucifixion position. Fracture of the thigh is treated by applying strapping to both legs and then attaching the ends to a cross bar over the cot, so that both thighs are equally and gently suspended for 2 weeks.

## DISEASES OF THE NEW BORN.

### **Ophthalmia Neonatorum.**

Infective organism,

Gonococci in 70 per cent. cases.

Others—streptococci, staphylococci, *Bacillus coli* and Koch-Week's *Bacillus*.

Infection usually occurs during birth. In some cases it may be carried by the nurse's hand or infected towels or even by the mother's hand after delivery.

**CLINICAL FEATURES**—About the second or third day the eyelids get stuck and there is straw coloured watery discharge from the eye.

**MILD CASES.**

Eyelids are red and swollen.

Discharge forms a crust at the margin of the lids.

• **SEVERE CASES.**

Eyelids are red puffy and tender.

Conjunctiva red and swollen.

Purulent discharge.

Bad corneal ulcers may form.

**PROGNOSIS**—Those which start 4 or 5 days after delivery, are generally non-gonococcal.

If the discharge is thick and creamy with little mucus, it is usually not gonococcal.

Streptococcal infection is the most serious and may lead to destruction of cornea.

Corneal ulcer is the most serious complication.

Prompt and thorough treatment may save the child's eye.

Fifty per cent. of blindness is caused by gonococcal ophthalmia.

### **TREATMENT.**

**PREVENTIVE.**

As soon as the head is born, wipe the child's eye with clean cotton wool soaked in boric lotion.

Put 1 per cent. silver nitrate drops in the eyes soon after birth and then wash them with normal saline every 2 hours, night and day.

Take steps that the eyes are not reinfected.

Keep the child's hands tucked in the binder.

Do not wash the eyes with the same water in which the child has been bathed.

**MILD CASES.**

Unilateral.

The sound eye must be kept well protected and should

always be examined first and covered with a pad of sterile gauze.

The child should be made to sleep with the sound eye uppermost if possible.

The affected eye must not be bandaged and the discharges should be allowed to escape freely. Drop 5 per cent. protargol into the eye and wash with normal saline.

#### SEVERE CASES.

The child is placed on the nurse's lap with its head between the doctor's knees.

Rubber gloves should be worn for dressing.

Pus may squirt out when the eye is opened.

1 per cent. silver nitrate dropped into the eye and then it is washed with normal saline.

Edges of the eyelids are painted with sterile castor oil.

Wash the eyelids at least every two hours with boric lotion.

If the cornea becomes hazy—Apply atropine ointment.

### Sepsis of the cord.

#### MILD.

The junction of the cord and umbilicus is moist and red and secretes pus.

When the cord separates, ulcer forms which may secrete pus.

TREATMENT—It should be cleaned with a piece of gauze soaked in hydrogen peroxide and dusted with antiseptic powder.

#### SEVERE.

1. Cellulitis spreading down to the pubis or upwards to liver. Child is extremely ill.

#### TREATMENT.

Hot fomentations.

If pus forms—incise and drain.

2. Or it may produce umbilical phlebitis, thrombosis and abscess formation, leading to jaundice and pyremia. This is a very serious condition and there is no particular treatment for it. Sometimes septic skin rashes develop as a result of a septic cord which are very fatal.

### Tetanus Neonatorum.

Infection of cord by tetanus bacilli.

#### TREATMENT.

Prophylactic.

Surgical cleanliness must be observed in cutting the cord.

Antitetanic serum.

Curative—Antitetanic serum and bromides.

PROGNOSIS—Bad.

### Other septic diseases.

Erysipelas neonatorum. Pemphigus (staphylo or streptococci found in pustules).

Fœtal pneumonia.

Infective jaundice. Cholangitis.

Mastitis neonatorum.

Hæmoglobinuria neonatorum—This is supposed to be caused by some sort of infection.

## ICTERUS NEONATORUM.

### Varieties, causes and treatment.

1. Child is born with an EXCESS OF RED BLOOD CORPUSCLES, some of which undergo destruction with the formation of excess of bile pigments.

2. CATARRH DUE TO GASTRO-INTESTINAL INFECTION at birth.

In this the child does not get any fever.

Treatment—Hydrarg. cum. creta 1 grain, with sugar of milk; followed by castor oil or olive oil, 3 hours later.

In very severe cases of green jaundice we have obtained great benefit from injecting 10-20 c.c. of whole blood of mother or father into the gluteal muscle. The jaundice rapidly clears up and vomiting ceases.

3. INFECTION OF THE UMBILICAL CORD.

It is a very serious condition.

The child almost always dies.

Symptoms—High fever, jaundice and septic cord.

4. DEVELOPMENTAL ABNORMALITIES of the bile duct, so that bile cannot pass into the intestine.

Always fatal.

5. CONGENITAL SYPHILIS causing hepatitis.

Antisyphilitic treatment.

6. FAMILIAL JAUNDICE.

Occurs in successive children.

Comes on a few hours after birth.

Seventyfive per cent. of them die with convulsions.

Cause—Unknown. May be due to some form of toxæmia.

### PROPHYLACTIC TREATMENT.

Mother—Diet should consist of plenty of carbohydrates and no meat.

Hexamine, sodium salicylate and calomel may be given.

Child—The baby should be fed as usual at the breast but a solution of 1 ounce of glucose and 1 teaspoonful of bicarbonate of soda to the pint to be given freely between feeds. Fractional doses of grey powder can be given three times a day and the bowels washed out with plain saline. In severe jaundice excellent results can be obtained by giving the child 2 or 3 intra-muscular injections of 10 c.c. of parent's blood exactly as it is done in melæna neonatorum.

PROGNOSIS—Mild cases all recover but if there is any cholangitis or congenital defects in the biliary duct system, the prognosis is very grave. A septic cord is a frequent cause of severe jaundice.

**CONGENITAL SYPHILIS.**

Usually the signs show themselves about the fifth week.

**SYMPTOMS.**

The child is usually small, shrivelled up with fissured lips and wrinkled face.

Cry is feeble.

Pemphigus may be present on the palm and sole.

May develop snuffles about the third week.

Condylomata may appear.

**TREATMENT.**

Antisymphilitic treatment.

Condylomata must be kept dry.

Mother should be treated as well.

**SKIN RASHES.**1. **SUDAMINAL RASH.**

Cause—Child being too warmly clothed.

Treatment—Dusting with zinc oxide and starch powder.

2. **VACCINATION RASH—Transitory.**3. **EPIDEMIC PEMPHIGUS—It is a manifestation of umbilical sepsis and is a serious condition.**4. **PAPULAR RASH—Due to gastro-intestinal disorder.**5. **URTICARIAL RASH.****THRUSH.**

It is caused by the growth of the fungus *oidium albicans* in the mouth.

Cause—Not cleaning the baby's mouth properly.

Symptoms—Little white patches on the cheek and soft palate.

**Treatment.**

Keep the mouth clean and bowel clear with paraffin and magnesia.

Apply glycerine and borax.

Application of dilute sulphurous acid.

**SORE BUTTOCKS.****Cause.**

1. Lack of cleanliness.

2. Irritating nature of the stools.

3. Napkins being washed with soda.

**Treatment.**

Buttocks are cleaned with olive oil.

Zinc cream and olive oil application.

Correct the diet either by skim milk (*vide* page 234.) or diluting mother's milk (*vide* diarrhoea in breast-fed baby).

**HÆMORRHAGIC DISEASES OF THE NEW BORN.**

- I. Hæmorrhage from the cord.
- II. Hæmatemesis and purpura.
- III. Melæna neonatorum.
- IV. Hæmorrhage from the genital organ of female child.

**I. Hæmorrhage from the cord.****1. PRIMARY HÆMORRHAGE.**

Cause—Ligature slipping or cutting through (being tied too tight).

Treatment—Apply a second ligature.

**2 SECONDARY HÆMORRHAGE.**

Cause—Sepsis. It is often associated with syphilis and jaundice.

Treatment—The umbilicus is transfixed with a needle and compressed by a figure of 8 ligature.

Injection of hæmostatic serum or hæmoplastin.

**II. Hæmatemesis and purpura.**

May be associated with melæna neonatorum or appear singly.

Treatment—Same as melæna neonatorum *vide infra*.

**III. Melæna neonatorum or gastro-intestinal hæmorrhage in the new born.** It may also be caused by ingestion of blood from cracked nipple.

In serious cases, generally hæmatemesis appears first and is followed by melæna.

**PROGNOSIS**—Serious. 50 per cent. of the children die if not treated as below.

**TREATMENT.**

Stop all food by the mouth. Only water to drink.

Calcium lactate 3 grains or calcium chloride 5 grains t. d. s.

Inject 20 c.c. of whole blood from the mother into the gluteal region and repeat in 12-24 hours. This is the only real means of cure.

Subcutaneous saline if necessary. \*

**IV. Genital hæmorrhage in the female child.**

Slight bleeding from the vagina may occur in the first few days.

It is always small in quantity and needs no treatment.

**GREEN DIARRHŒA OR INDIGESTION IN BREAST-FED BABY.****Treatment.**

**DON'T STOP BREAST FEEDING,**

**MOTHER** to take a dose of salts or Eno's each morning.

Nipples must be kept clean.

She must avoid constipation and drink a glass of water before

\* each breast feed

Breasts should be alternately hot and cold sponged for 15 minutes twice daily and they should be massaged (from periphery towards the nipple).

#### BABY.

Mouth must be kept scrupulously clean.

Half-ounce of boiled water and with 2 grains of sodium citrate before each feed.

Feeding at both breasts for 7 minutes every 3 hours.

Between the feeds, give the baby a mixture of  $\frac{1}{4}$  per cent. sodium bicarbonate and  $\frac{1}{4}$  per cent. saline with little saccharin, as much as the baby will take. If œdema appears, stop saline but continue the sodium bicarbonate solution.

Weigh the baby after each feed and find out how much he is taking at each feed.

- i. If less than the correct quantity—Supplement the feeds with whey or skimmed milk and water. Dilute the feeds with boiled water, first month 1 in 2, second month 1 in  $1\frac{1}{2}$ , third month 1 in 1. If the child is very feeble dilute with whey.

- ii. If more than the correct amount—Cut down the time at the breast.

If it is a very advanced case—Supplant one or two breast feeds with whey or skimmed milk.

If the child is having frequent green motions—Give a warm water enema with catheter.

If the buttocks are sore—Apply zinc oxide and castor oil.

If the bowels move immediately after each feed—Give tinct. camphor co. 3 minims, before each feed.

### CONVULSIONS.

#### CAUSES.

- i. Injury to brain during delivery
- ii. Gastro-intestinal irritation.

#### TREATMENT OF FIT.

Loosen the clothing.

Draw the tongue forward.

Put the child in a warm bath.

Put a handkerchief soaked in cold water on the head.

Artificial respiration should be given if necessary.

Chloral hydras or potassium bromide 5 grains by mouth or few whiffs of chloroform.

If gastro-intestinal, give castor oil and follow with warm water enema.

### CONGENITAL DEFORMITIES.

Meningocele.

Hydrocephalus.

Hare lip and cleft palate—Operation should be done between the ages of 6 months and 2 years.

Distended abdomen due to tumour of any of the viscera.

Spina bifida.

Extroversion of the viscera—Absence of part of the anterior abdominal wall and rami of pubis.

Ectopia vesicæ.

Imperforate anus—Surgical treatment according to the degree of obstruction.

Imperforate urinary meatus—Usually born dead.

Phimosis—Circumcision.

Umbilical hernia,

Put a pad and binder on.

Remove any cause of straining *e.g.* phimosis, if present.

#### MONSTERS.

Anencephaly—Absence of the vault of skull.

Double monsters—Four chief varieties.

Thoracopagus—Joined by thorax.

Ischiopagus—Joined by the sacrum.

Dicephalus—Two heads and one body.

Syncephalus—One head and two bodies.

#### FETAL AMPUTATIONS.

##### Causes.

- (1) Maldevelopment.
- (2) Amniotic bands—These may strangle the limb and interfere with the circulation of the limb.
  - i. Congenital.
  - ii. Adhesions between the amniotic membrane and the foetus due to oligo-amnios.
- (3) The cord may be twisted round the limb. It is very unlikely that this could cause sufficient pressure to strangle the limb; because long before the limb could be strangled by the cord, the circulation in the cord itself would stop and the foetus would be dead.
- (4) Thrombosis of the vessels of the limb due to endarteritis.



## SECTION VIII.

### ANÆSTHESIA. OBSTETRICAL OPERATIONS. DRUGS AND X' RAYS IN OBSTETRIC PRACTICE.

#### CHAPTER I.

### ANÆSTHESIA IN OBSTETRIC PRACTICE

#### A. Anæsthesia in normal labour.

Chloroform or ether may be used but the anæsthesia must not be pushed to the full surgical degree.

**METHOD**—It should be started in the latter part of the second stage when the head becomes palpable through the perineum. Pour a few drops on the mask at the beginning of each pain and ask the patient to take deep breaths. Remove the mask as soon as the pain ceases and start it again when the pain returns. It must be stopped as soon as the head is born.

Junker's apparatus is the ideal method of giving chloroform or A.C.E. mixture as the patient can compress the bulb herself and can never overdose herself.

The use of gas and oxygen anæsthesia is also very satisfactory but not feasible in India.

#### B. Anæsthesia for operations on gravid uterus.

- i. Replacement of retroverted uterus.  
Ether preceded by injection of atropine.
- ii. Myomectomy—Spinal anæsthesia or open ether.
- iii. Conditions associated with injury and shock—Gas and oxygen or spinal anæsthesia.
- iv. For manipulations of the foetus *in utero*.  
Gas and oxygen or spinal anæsthesia.  
Chloroform—Not so good.  
Ether—Promotes secretion and is a stimulant.
- v. Evacuation of gravid uterus.  
In cases of phthisis, toxæmia, diabetes, heart disease—  
Spinal anæsthesia.
- vi. Cæsarean section—Induced with chloroform and later ether is substituted as soon as the uterus is opened.  
Or spinal anæsthesia.

#### C. Scopolamine anæsthesia (Twilight sleep).

A degree of semi-consciousness is produced which prevents feeling of acute pain. It is applicable to all cases where normal delivery is expected and is specially useful when

labour is likely to be prolonged or the patient is nervous. There is no risk to the mother and very little danger to the child, provided morphia is not used.

#### DISADVANTAGES.

1. Delayed labour and therefore additional risk of infection.
2. In quite a number of cases delivery has to be assisted with forceps. But the patient has no memory thereof and consequently no emotional shock.
3. Very rarely maniacal symptoms may appear.
4. The child is very occasionally born asphyxiated or in an apnoëic condition. But in 90 per cent. it is born pink and cries lustily at once.
5. Physician must always be at hand.
6. Constant watchfulness is needed to keep bladder empty and control patient.

The maniacal symptoms may be due to idiosyncrasy. If the patient becomes maniacal, stop scopolamine; chloroform may be required to quieten the patient.

#### METHOD.

Initial dose— $1/100$  gr. of scopolamine every  $\frac{1}{2}$  hour for 3 doses is given subcutaneously, when the labour pains have definitely started and the external os is 2-3 fingers dilated.

Patient is kept in a dark room, with the ears plugged with cotton wool and the eyes bandaged.

Two hours after the third injection, a common object is shown to her and she is asked to name it. If she can do so, she is asked whether she has seen it before. If she cannot answer these questions correctly, it shows that the required amnesic state has been reached. This is known as the memory test.

If memory is not lost,  $1/200$  gr. more of scopolamine is given, and the test is again applied after another 2 hours and the scopolamine injection is again repeated until the complete amnesic state is reached.

If the patient appears to be sufficiently narcotised one or two injections may be omitted. If the pains are becoming very feeble, one to three minims of pituitrin may be added with one or two injections.

Twilight sleep shortens the first stage and lengthens the second stage of labour.

#### SPECIAL INDICATIONS for the use of scopolamine anæsthesia.

- i. When the patient is nervous and hyperæsthetic or suffering from exhaustion or fatigue.
- ii. Spasmodic rigidity of the cervix.
- iii. Eclampsia—It diminishes the nervous excitability.
- iv. It is very useful in primipara; we have used it in many hundreds of cases. Beyond occasional delirium demanding chloroform there have been no complications in mother or baby due to the method.
- v. The risks of postpartum hæmorrhage, obstetric and foetal shock are decidedly diminished.

## CHAPTER II.

# OBSTETRICAL OPERATIONS.

## PREPARATION OF THE PATIENT FOR OBSTETRICAL OPERATIONS.

Bowels are cleared with soap water enema.

Lower abdomen, pubic region and the inner side of thighs are shaved.

Vulva is thoroughly washed with soap and water and then swabbed with tincture of iodine, or a mixture of brilliant green and crystal violet.

Bladder is evacuated by catheter.

Vagina is swabbed with tincture of iodine or a mixture of brilliant green and crystal violet.

Williams was of opinion that disinfection of vagina is not necessary if the patient has not been subjected to internal manipulations or vaginal examinations. He used mercurochrome solution for disinfection. In cases where internal manipulations have been done, the mercurochrome solution is rubbed into the irregularities of the vaginal wall.

## DILATATION OF CERVIX.

### Methods.

I. Instrumental.

II. Manual.

III. Incision of cervix or vaginal hysterotomy.

### I. INSTRUMENTAL.

(a) DILATORS OF BOSSI OR FROMMER TYPE is not used.

(b) HEGAR'S DILATORS—If the patient is not in labour, dilatation may be started with Hegar's dilators until a finger can be introduced into the cervix.

If the case is not very urgent it is better to introduce a tent and then to dilate the cervix manually or with Hegar's dilators 24 hours later.

Tents are sterilised by keeping them in absolute alcohol.

(c) HYDROSTATIC BAG *e.g.*, Champetier de Ribes' bag.

#### Indications.

1. Delay in dilatation, after premature rupture of the membranes.
2. Stenosis of cervix, not yielding to drugs and hot douches.

3. In certain cases to effect rapid delivery *e.g.*, prolapse of cord.
4. In cases of placenta prævia—To keep pressure on the placental site.

#### Method.

First of all the capacity of the bag is determined by measuring the quantity of water that is required to fill the bag. This can also be done by noticing the number of times that the pump is required to be squeezed in order to fill up the bag.

The bag is sterilised by boiling.

It is folded and clamped by the special forceps used for inserting it and introduced into the cervix for about 4—4½ inches.

The lock of the forceps is then undone, but it is not removed.

Higginson's syringe is now attached to the dilator and water is gradually pumped in. When the bag is half filled, one of the blades is gently taken out; then a little more water is pumped in and the other blade is taken out. The bag is then filled up to its maximum capacity.

When the bag comes out, the circumference of the cervix is about 13", and the diameter about the breadth of four fingers (depending on the size and capacity of the bag).

#### Disadvantages.

- i. May burst and in tropics rapidly deteriorates.
- ii. Presenting part may be displaced.
- iii. Infection.

## II. MANUAL DILATATION.

Deep anaesthesia is required. Spinal anaesthesia is very helpful.

Strict aseptic precautions must be observed.

#### HARRIS'S METHOD.

Hand and fingers are lubricated, and introduced into the vagina.

Index finger is steadily pushed through the cervix and internal os. Then the middle finger is also pushed in.

Middle finger is then withdrawn and thumb is introduced. The cervix is gradually stretched by separating the thumb and index finger (as in snapping). As the dilatation progresses two, three, and finally all the fingers are introduced and employed.

## III. BIMANUAL DILATATION.

First of all one index finger is introduced into the cervix. Then the index finger of the other hand is introduced into the cervix and the two fingers are forcibly and

steadily separated. Williams stated that this method is more liable to infection. We have never employed it.

## INDUCTION OF ABORTION AND LABOUR.

### Induction of abortion.

The opinion of a second independent practitioner should always be taken before undertaking this operation.

### INDICATIONS.

#### A. TO SAVE MOTHER'S LIFE.

- i. Vomiting of pregnancy—Toxæmic type.  
It may be required for neurotic type of vomiting when other methods of treatment have failed and the patient is getting worse.
- ii. Infected uterine contents—Generally due to criminal abortion.
- iii. Retroverted and incarcerated gravid uterus—When reposition has failed and the patient refuses abdominal operation.

#### B. CONDITIONS WHICH MAY THREATEN MOTHER'S LIFE IF PREGNANCY IS ALLOWED TO PROGRESS.

- i. Pre-eclamptic toxæmia.
- ii. Chronic nephritis, heart disease, chorea, Graves' disease.
- iii. Hydatidiform mole.
- iv. Uterine hæmorrhage.

#### C. TO AVOID CERTAIN DANGEROUS COMPLICATIONS THAT MAY ARISE IF THE PREGNANCY CONTINUES.

- i. Marked contraction of pelvis, and the patient refuses Cæsarean section.
- ii. Tumour in abdomen or pelvis.
- iii. Early tuberculosis.
- iv. Slight disparity between head of foetus and pelvis.

### METHODS.

#### RAPID.

1. In the early months *i.e.*, up to the 12th week of pregnancy.  
Anæsthesia—Local anæsthesia, by injecting procaine deeply into the cervix and parametrium, works very well.  
Dilate with Hegar's dilators and then introduce the index finger and bring out the ovum.
2. Later months *i.e.*, after the 12th week of pregnancy, and up to 16th week.  
Vaginal hysterotomy.  
General anæsthetic.

Speculum is introduced into the vagina and the cervix is exposed.

Cervix is held with sponge forceps and pulled down.

A longitudinal incision is made on the anterior wall of the cervix and the mucous membrane is separated.

Bladder is pushed up.

Cervix is divided along the whole length of the incision.

Uterus is evacuated.

Hot intrauterine douche.

Cervix is sutured.

Mucous membrane stitched with continuous catgut suture.

**Note.**—This is a serious operation and should never be undertaken except by a specialist. In our opinion the safest, easiest and wisest course in all such cases after 13th week is abdominal hysterectomy; for it has the additional advantage of permitting the ligation of the tubes if the morbid conditions of the patient indicates it.

**Slow.**

- (1) Laminaria tents, useful up to the 12th week.

General anæsthetic.

Speculum in vagina, and cervix drawn down with ring or sponge forceps.

Introduce a laminaria tent (the largest size that can be inserted).

**NOTE**—Tents are sterilized by keeping them in absolute alcohol for 48 hours.

Lightly plug the vagina to keep the tent in position.

Abortion may complete itself without further interference.

If not, the tent is removed after 24 hours, cervix is dilated with Hegar's dilators (if a finger cannot be introduced) or with the finger and the ovum is removed with ovum forceps or by the finger.

Always explore the uterine cavity with the index finger, at the completion of the operation to ensure that the uterus is thoroughly empty.

**Danger**—Sepsis. So some authorities do not recommend tents.

- (2) Plugging the cervical canal with gauze soaked in glycerine.

Plug the cervical canal and then the vagina with gauze soaked in glycerine.

Remove the plug after 24 hours; the ovum generally follows it.

If not, it is soft enough to be easily dilated with Hegar's dilators or to admit the finger.

Ovum is then removed with ovum forceps or by the finger.

- (3) Perforation of the membranes.

The action is very uncertain.

**Induction of labour.****INDICATIONS.**

1. Contracted pelvis with slight disparity.
2. Diseases of the mother.
  - i. Toxæmia.
  - ii. Nephritis.
  - iii. Cardiac disease.
  - iv. Tuberculosis—When the mother is likely to die before full term.
  - v. Grave types of chorea.
  - vi. Diabetes—Patient is steadily getting worse in spite of proper treatment.
  - vii. Pernicious megalocytic anæmia—Very common in Bengal.
  - viii. Pyelitis leading to pyelonephritis.
  - ix. Hydramnios—Abdomen too much distended.
  - x. Placenta prævia.
3. History of two or three previous pregnancies resulting in the birth of a dead child at term—Induce labour about a week before the time when the symptoms usually occur.
  - i. Habitual death of the fœtus.
  - ii. Post-maturity.

Causes of death,

  - (a) Degeneration of placenta, and blood changes, causing circulation of toxins.
  - (b) Over-ossification of skull bones.
  - (c) Large size of the head—Intracranial hæmorrhage.

**CONTRACTED PELVIS.**

The best time for induction is about the 38th week.

If labour is induced before this time, fœtal mortality is very high.

Induction of labour before 38th week gives very disappointing results in tropics.

Castor oil and quinine method is very efficacious in multiparæ after the 38th week. But it usually fails before this period.

Bougies—Indicated about the 36th—37th week.

Stomach tube or bougies—Indicated about the 37th—38th week.

Hydrostatic bag—Not suitable, as it displaces the presenting part.

**METHODS OF INDUCTION.**

1. Castor oil, quinine and pituitrin method.

Effective only from the 38th week.

- |           |       |                       |
|-----------|-------|-----------------------|
| 6 A.M.    | . . . | Castor oil, 2 ounces. |
| 6-30 A.M. | . . . | Hot tea.              |
| 7 A.M.    | . . . | Hot bath.             |
| 8 A.M.    | . . . | Hot enema.            |

- 9 A.M. . . . . Quinine 10 grains.  
 11 A.M. . . . . Quinine 10 grains.  
 1 P.M. . . . . Quinine 10 grains.  
 4 P.M. . . . . Pituitrin 3 minims.

and then 3 minims of pituitrin every  $\frac{1}{2}$  hour up to one c.c. unless the uterine contractions start in the mean time.

Williams was of opinion that injections of pituitrin may cause tetanic contractions of the uterus. We use a pledget of gauze soaked in 1 c.c. of pituitary extract introduced into the nose beneath the inferior turbinate bone. First pledget is introduced three hours after the last dose of quinine and reapplied at half hourly intervals until efficient uterine contractions start or until six applications have been made without any effect.

## 2. RUPTURING THE MEMBRANES.

Specially indicated for,

- i. Hydramnios.
- ii. Delayed or desired onset of labour.
- iii. Some cases of antepartum hæmorrhage.

An anæsthetic may be required for a primigravida, seldom for a multipara.

Lithotomy position.

Speculum in the vagina.

Anterior lip of the cervix is seized with sponge forceps and steadied.

Membranes are perforated with Kocher's forceps (they are pinched with the forceps and then torn).

By pushing the head alternately up with the fingers and then letting it down, a considerable quantity of liq. amnii can be evacuated, and labour starts soon after.

Or one may pass a prostatic catheter or unsheathed Bozeman catheter through the cervix round the head, and then by dipping the hand perforate the membranes high up and draw off a pint or more of liq. amnii. The head then descends and labour commences.

In a series of 50 cases in the Eden, there was one failure, and one death of the fœtus. The average time of onset of labour in these cases was 11 hours.

This method may be added to castor oil and quinine method, if pains do not start within six hours since the last dose of quinine. If this is not effective, subsequent administration of pituitary extract almost invariably induces labour.

## 3. PLUGGING THE VAGINA with gauze soaked in glycerine.

Not of much use by itself.

Combined with rupture of the membranes, it is useful for some case of antepartum hæmorrhage and rigid cervix.



## 4. KRAUSE'S BOUGIE.

Solid bougies are used. They are sterilised by keeping them in 1 in 500 of biniodide of mercury solution, in formalin vapour in a glass tube or may be boiled for 5 minutes and immediately immersed in cold sterile water for half an hour.

Anæsthetic—A general anæsthetic is given.

Lithotomy position.

Anterior lip of cervix is seized with sponge forceps.

External os wiped clean of mucus and painted with 1 in 100 brilliant green.

Cervix is slightly dilated (about the size of one finger), with Hegar's dilators. This is rarely necessary.

A finger is introduced into the cervix and swept round the lower segment to separate the membranes as far as possible.

A bougie is passed into the cervix without touching the vaginal walls, and is gently pushed into the uterus between the uterine wall and the membranes. It should be passed in until some definite resistance is met with. If any obstruction is come across, the direction should be changed otherwise it will injure the placenta. The bougie is passed in until its end is flush with the external os.

Usually four bougies are introduced.

Small vaginal tampon is put in to keep the bougies in position.

Drawback—Uncertainty.

If labour does not start in 36 hours, bougies should be removed and the uterus is left alone for 48-72 hours and then labour may be induced by some other method; otherwise serious infection is liable to occur.

## 5. STOMACH TUBE.

No anæsthetic is required.

The tube is introduced in the same way as the bougie until only 3 or 4 inches of it remain outside.

Small gauze tampon in the vagina.

Labour pains start within a few hours and when the cervix is 3 fingers dilated, the tube is taken out and a hot vaginal douche is given.

If labour does not start within 48 hours, the tube is taken out and castor oil and quinine method is adopted.

In a series of 50 cases in the Eden, there was no failure of onset of labour, the baby being born in an average of 16 hours from the time of insertion of the tube.

6. HYDROSTATIC BAG *e.g.*, Champetier de Ribes' bag.

Method of introduction—See page 250, 251.

It is better to rupture the membranes before introducing the bag.

The bag is usually expelled within 8-12 hours.

Disadvantages,

- i. Risk of sepsis.
- ii. The bag may leak or burst or be rotten.
- iii. Presenting part may be displaced.
- iv. When the bag is expelled, cord may be prolapsed.
- v. It may be nipped between the head and pelvis and cause difficulty in extraction.
- vi. Laceration of cervix.

Nowadays we never use De Ribe's bag in the Eden Hospital.

## VAGINAL PLUGGING.

### Method.

Skin and vagina are thoroughly disinfected.

Vaginal speculum is introduced.

Bladder is evacuated with a catheter.

A general anæsthetic is given.

Lithotomy position.

Membranes should be ruptured specially in cases of antepartum hæmorrhage.

Plain sterilised gauze, iodoform gauze, or gauze soaked in a solution of 1 in 1000 of flavine, is used for plugging. Some people use pledgets of cotton wool about the size of a double walnut tied with a piece of thread.

Left hand is placed in the vagina, and gauze is fed into this hand from a roll by the right hand.

Left hand packs the gauze all round the cervix tightly, filling up all the fornices. If the cervical canal is dilated, it must be packed first of all. The gauze must be firmly packed so as to distend the vaginal canal, and a portion of it should remain projecting outside the vulva.

Patient put on her back and a tight binder is applied.

A T-bandage is now fixed tightly so as to maintain firm and continuous pressure on the packing.

A catheter should be passed after six hours if the patient does not pass urine.

If labour does not start within 24 hours, the plug should be removed and a fresh plug introduced, if necessary

### ADVANTAGES OF VAGINAL PLUGGING.

1. Arrest of accidental hæmorrhage.
2. Requires no intrauterine manipulations and therefore less risk of infection.
3. Does not cause any laceration of cervix.
4. Does not need any special apparatus or instrument

### DISADVANTAGES AND LIMITATIONS.

- i. In order to be effective, membranes must be ruptured.
- ii. To obtain the best results, the presentation must be vertex, so that efficient pressure may be exerted.

- iii. Very liable to infection, so it must be removed after 24 hours. For this reason we do not employ it, or recommend plugging in the tropics.
- v. Efficient plugging is rather a difficult operation.

## FORCEPS.

### Varieties.

#### 1. SHORT FORCEPS.

They are straight and there is no pelvic curve.

Used when the head is low in pelvis.

May be used for rotation of head in occipito-posterior presentation.

#### 2. LONG CURVED FORCEPS.

A pelvic curve is present.

Used for low or mid forceps operations.

The presence of shank, between the blade and handle increases the length of the forceps by  $2\frac{1}{2}$ ".

#### 3. AXIS-TRACTION FORCEPS.

Traction can be applied in the true axis of the pelvis.

Traction rods are detachable, so it may be used as ordinary long forceps.

Most commonly used.

#### 4. KIELLAND FORCEPS.

Very suitable for delivery when head is above the brim and specially in transverse position, *i.e.*, the antero-posterior diameter of the head is in the transverse diameter of the pelvis.

Requires a good deal of practice and experience for efficient use. Having tried them we do not recommend them.

### AXIS-TRACTION FORCEPS.

#### PARTS.

Blade,

Fenestrated.

Have got two curves, pelvic and cephalic.

When locked the interval between the tips is 1" and that between the widest part is  $3\frac{3}{8}$ ".

Shank—Part between the lock and the blade,  $2\frac{1}{2}$ " long.

Lock—English lock best.

Handle—5" long.

Fixation screw.

Axis traction rod.

In Milne Murray's type of forceps, one traction rod is attached to each blade, which fits into a slot at the lower part of the fenestra.

In Neville's forceps, the upper end of the tractor is fitted to the part between the shank and the blade.

**ADVANTAGES OF AXIS-TRACTION FORCEPS.**

1. Blades are fixed with a screw, therefore they cannot tilt.
2. Traction can be made in the correct axis of the pelvis, so greater mechanical advantage.
3. Allow rotation of the head during traction.
4. One hand can be used for traction and the other for counter-pressure on the buttocks.

**ACTION OF FORCEPS.**

- i. Tractor.
- ii. Rotator.
- iii. Lever,
  - By side to side or pendulum movement of the blades.
  - One of the blades may also be used as vectis for flexing the head in persistent occipito-posterior cases with incomplete flexion (very rarely done).
- iv. Compressor—To crush the head after perforation. They should not be used for this purpose.

**\*Indications for the use of forceps.**

1. UTERINE ACTION IS NOT STRONG ENOUGH TO EFFECT DELIVERY.
  - i. Sluggish uterus.
  - ii. In cases of uterine exhaustion, forceps may be applied before exhaustion sets in; when the uterus is actually exhausted, child must not be delivered until the pains return.
2. ABNORMALITIES IN SIZE AND POSITION OF THE CHILD.
  - i. Large head.
  - ii. Post-maturity.
  - iii. Occipito-posterior or face presentation.
3. DISPROPORTION BETWEEN THE HEAD AND PELVIS.
 

Every opportunity should be given for spontaneous delivery, and forceps must not be applied until the moulding of the head is complete to the fullest degree possible.

If the head is above the brim, forceps are generally contra-indicated.

If the head is in the cavity,

Anterior-parietal presentation—Forceps may be used.

Posterior-parietal presentation—Forceps contra-indicated.
4. ABNORMAL DIRECTION OF UTERINE FORCE, *e.g.*, obliquity of the uterus, pendulous belly etc.
5. SOFT PARTS OF THE MOTHER ARE OBSTRUCTING DELIVERY.
  - i. Œdema of cervix.

\* Summarised from "Midwifery by Ten Teachers".

- ii. Rigid perineum.
- iii. Hæmatoma of vulva.
- 6. WHEN IT IS NECESSARY TO DELIVER THE MOTHER QUICKLY.
  - i. Heart and lung diseases of the mother.
  - ii. Typhoid and other fevers.
  - iii. Acute chorea.
  - iv. Antepartum hæmorrhage (some cases).
  - v. Prolonged labour with rise of pulse and temperature.
- 7. WHEN IT IS NECESSARY TO DELIVER THE CHILD QUICKLY.
  - i. Fœtal heart rate less than 120 or more than 160 per minute.
  - ii. Passing of meconium unmixed with liquor amnii, in cases of head presentation.
  - iii. Tumultuous movements of the fœtus.
  - iv. Large caput succedaneum.
  - v. Head is fixed and cord prolapsed.

**Conditions which must be fulfilled before forceps is applied.**

- 1. Bladder emptied with catheter. Rectum must be empty.
- 2. Membranes must be ruptured.
- 3. Cervix must be fully dilated.
- 4. Pains must be present.
- 5. Disproportion between the head and pelvis is not too great.

**Contra-indications for forceps application.**

- 1. Uterus in tonic contraction.
- 2. Child is dead and there is difficulty in delivery.
- 3. Exhausted uterus
- 4. It should never be applied over breech or brow.

**Dangers of forceps delivery.**

**MOTHER.**

- i. Soft parts may be lacerated.
- ii. Postpartum hæmorrhage may follow rapid delivery or delivery of an exhausted uterus.
- iii. Injury to the bony pelvis and the pelvic joints.
- iv. Infection.

**CHILD.**

- i. Fracture of the skull or injury of scalp.
- ii. Intracranial hæmorrhage.
- iii. Cephalhæmatoma.
- iv. Facial paralysis.
- v. Injury of the eye.
- vi. Asphyxia due to pressure on the head (fœtal shock).

**Sites and levels for application of forceps.**

- 1. High forceps—Head above the pelvic brim or just engaged in the brim

2. Mid forceps—Head in the pelvic cavity but has not reached the pelvic floor.
3. Low forceps—Head low in the pelvic outlet.

### **Application of forceps.**

#### **DETERMINATION OF RIGHT AND LEFT BLADES.**

Hold each blade in turn as it would lie in the pelvis of an imaginary patient. The cephalic curve so placed that it would grip the head and pelvic curve so turned that it would lie in the curve of the pelvis.

Two methods of application,

1. Pelvic.
2. Cephalic.

#### **1. PELVIC METHOD—Application in relation to the pelvis.**

The blades are applied in relation to the transverse or oblique diameter of the pelvis; therefore the pelvic curve of the forceps always corresponds to the curve of the pelvis.

This method is almost universally adopted.

Difficulty may be experienced in locking the forceps.

Anæsthetic. A rubber dam is clipped over the anus and to each buttock.

#### **PATIENT IN LEFT LATERAL POSITION.**

Position of the head is determined after a thorough examination.

Left hand is placed in the vagina, between the head and cervix or vagina, with the palmar surface looking upwards.

The left or lower blade is held in right hand, with the traction rod close to the handle and is passed over the left hand until the head is encountered. The handle is then directed upwards and then backwards and downwards. The shank comes in contact with the perineum and the rough surface of the handle is directed upwards. An assistant holds the blade in position.

Then the left hand is placed between the cervix or vagina and the head with the palmar surface directed downwards.

The right or upper blade is taken in the right hand and passed under the left hand until the head is encountered. The handle is then directed downwards and then backwards and upwards. The inner surface of the handle looks downwards.

The two handles should be lying in contact with each other. Traction rods are held back and the blades are locked and the fixation screw adjusted.

Traction handle is then fixed.

If the blades cannot be locked, they must be removed and reapplied.

**NOTE—**Because of the lessened risk of sepsis and greater ease of application we always teach and use the dorsal position for forceps in the Eden Hospital.

**PATIENT IN DORSAL POSITION.**

For introduction of the left or lower blade, it is held in the left hand while the right hand serves as guide.

For introduction of the right or upper blade, it is held in the right hand while the left hand serves as the guide.

**II. CEPHALIC METHOD.**

Application in relation to the head of the child.

Anæsthetic.

If the patient is in left lateral position—Introduce left hand in the vagina for guiding the blade in all cases.

If the patient is in dorsal position—Introduce the right hand to guide the left blade and the left hand to guide the right blade.

Pass one hand in the vagina and determine the position of the posterior ear.

Apply the corresponding blade there. If the ear is on the left side apply the left blade. If on the right side, right blade.

If the head is lying transversely—Apply the right blade if the occiput is pointing to the right and *vice versa*.

If the head is lying antero-posteriorly, so that neither ear is posterior—Apply left blade over the left ear and the other blade over the other ear.

**ADVANTAGES.**

A firm grip of the head is obtained.

Head is seized in the least injurious manner.

Head is pulled in the natural position of flexion.

Minimum amount of force is required.

**DISADVANTAGES.**

When the head is above the brim, the antero-posterior diameter of the head lies transversely. So forceps has to be applied in the conjugate diameter which is not satisfactory, as,

(1) Pelvic curve of the blades does not correspond to the curve of the pelvis.

(2) Blades take up a certain amount of room and thereby make the true conjugate (which is generally already contracted) narrower.

**Traction.**

First try with one hand only. If this fails use both hands.

Traction should be made intermittently, concurrently with pains. Fixation screw should be loosened between the pains.

Direction of traction.

In Milne-Murray type of forceps—Keep the traction rods in contact with the shanks.

In Neville's forceps—An arrow mark indicates the direction of traction.

When the head appears over perineum,

We recommend that the forceps should be removed and delivery allowed to end naturally unless urgent delivery needful.

Others advise that delivery should be helped by bringing the head forwards by manipulating the application handle.

**Forceps in occipito-posterior presentation.**

Failing manual rotation—Traction is applied with axis traction forceps. If the head rotates during traction, the blades are removed and again applied.

Rotation by means of forceps should not be practised to the point of using any force.

**Face presentation.**

It is better if it can be avoided.

Cephalic method is preferable.

During application be careful not to damage the face. Try to apply the blades over the occipito-mental diameter as far as possible.

In mento-posterior cases forceps is contra-indicated unless the child is very small.

**Brow presentation**—Forceps contra-indicated.

**\*After-coming head in breech presentation.**

It is better to use Neville's forceps.

During application of forceps, the baby is held forwards and upwards if the occiput is in front, and backwards and downwards if the occiput is behind.

Blades are applied in the ordinary way.

Traction is first applied downwards and backwards, trunk of the baby being carried upwards and forwards.

**Kielland's forceps.**

Peculiarities,

Blades are narrower than those of ordinary forceps.

There is practically no pelvic curve.

There is no lock but the blades are articulated by means of a slot carried on one of them. So the head can be grasped by the blades even when the blades are at different vertical levels.

**METHOD OF APPLICATION.**

Anæsthetic.

Patient in dorsal position.

Exact position of the head is diagnosed.

Index and middle fingers of the left hand are introduced into the vagina to guide the blades

Anterior blade is applied first with its convexity towards the baby's head and the concavity towards pubis. It is then rotated through 180 degrees so that the concave side comes in contact and encounters the head. The rotation must be



made in the intervals of pain. It is then held in position by an assistant.

Posterior blade is then applied (in the ordinary way) guided by the fingers of the left hand in the sacral hollow until the tip of the blade passes the promontory and encounters the head.

Then the blades are locked.

Patient may now be put in Walcher's position if necessary.

#### ADVANTAGES OF KIELLAND'S FORCEPS.

1. As the blades fit the head more exactly, traction and descent are easier.
2. Intracranial injuries are less frequent.
3. Blades can be locked even when they do not reach the same height.
4. The splinting action of the anterior blade is an added advantage.

#### DISADVANTAGES.

1. Slipping of forceps. This is generally due to faulty application.
2. Injury of the bladder.
3. Rupture of the lower uterine segment. These can be avoided by careful application.
4. Very difficult to apply. We do not now employ them.

### VERSION.\*

**DEFINITION**—Alteration of the lie or presentation of the child.

**Cephalic version**—When the head is made to present.

#### INDICATIONS.

- i. Transverse presentation in normal pelvis.
- ii. Breech presentation in primipara (pelvis being normal).

**Podalic version**—When the breech is made to present.

#### INDICATIONS.

##### I. MALPOSITIONS OF THE CHILD.

- i. Transverse presentation, and cephalic version has failed.
- ii. Face presentation, with slightly contracted pelvis.
- iii. Brow presentation, and the presenting part has not entered the pelvis.
- iv. Prolapsed arm—Reposition and forceps traction having failed.
- v. Dorsal displacement of arm and reposition has failed.
- vi. Prolapsed cord, reposition has failed, cervix not dilated enough for forceps application.
- vii. Locked twins—One being transverse presentation.

\* Summarised from "Midwifery by Ten Teachers".

2. ANTEPARTUM HÆMORRHAGE.
  - i. Placenta prævia.
  - ii. Certain cases of accidental hæmorrhage when rapid delivery is indicated but the cervix is not dilated enough for forceps application.
3. FLAT PELVIS.
  - i. An alternative to forceps in minor degrees of contraction.
  - ii. Scolio-rachitic pelvis—When head is entering the pelvis with the occiput in the less roomy side.
  - iii. Posterior-parietal presentation.
4. PROLAPSED CORD—After reposition if there is any tendency of its coming down again.
5. SOME CASES OF DOUBLE MONSTERS.
6. TO HASTEN DELIVERY.
  - i. Eclampsia.
  - ii. Heart disease.
  - iii. Pulmonary disease.

#### CONTRA-INDICATIONS FOR VERSION.

1. Tonic contraction of uterus.
2. Head or breech has entered the pelvic cavity.
3. True conjugate is less than  $2\frac{3}{4}$ ".
4. Generally contracted pelvis.
5. Hydrocephalic child.
6. Child dead (except to hasten delivery or to stop hæmorrhage).

#### METHODS.

- I. External version—Changing the presentation by manipulations through the abdominal wall alone.
- II. Bipolar version—Manipulations by one hand on the abdomen and only two fingers of the other hand in the uterus, the rest of the fingers being in the vagina.
- III. Internal version—Manipulations by one hand on the abdomen and the whole of the other hand in the uterus.
  - I. i. EXTERNAL CEPHALIC VERSION.
 

Should be done between the 35th and 40th weeks of pregnancy.

If labour has started, the membranes must be intact to allow this to be carried out.

The bladder and rectum must be primarily empty.

The patient lie on her back with the pelvis slightly raised and thighs flexed.

An anæsthetic is usually needed.

First, the presenting part is lifted out of the pelvic brim with two hands and then by small jerks the head is pushed down towards the pelvis with one hand while the breech is pushed towards the fundus in the opposite direction with the other.

The head is pushed in the same direction as the baby is looking in order to maintain flexion.

When the child is in the longitudinal lie, its head should be pressed into the brim and a binder applied. Occasionally the help of an assistant is useful while rotating the foetus.

ii. EXTERNAL, PODALIC VERSION.

The remarks made and the direction given under external cephalic version may be applied to external podalic version substituting the word breech for that of the head.

II. BIPOLAR VERSION.

Patient lies on her back with the legs flexed.

Pass index and middle fingers of the right hand through the cervix.

Push the presenting part away with the vaginal fingers, press the breech or head into the pelvis with the hand on the abdomen.

When a foot reaches the internal os, it is pulled down. In cases of difficulty, the foot may be caught with volsellum forceps and brought down.

III. INTERNAL VERSION.

Anæsthetic.

Position of the patient—Same as before.

Pass the whole hand into the uterus.

Catch hold of a leg and bring it down.

The external hand helps in turning the child when the leg is pulled down.

The best hand to use is that one, whose palmar surface faces the foetal limbs.

If one of the hands is prolapsed, tie a cord at the wrist so that it is not pushed up during manipulation.

In some cases of difficulty, the leg may be brought down in the following way.

Tie a cord round the child's knee or ankle, or pass a breech hook round the knee and then apply traction by it. The internal hand pushes the presenting part away from the cervix and an assistant helps by manipulating through the abdominal wall.

## CÆSAREAN SECTION.

### Indications.

I. ABSOLUTE—When this is the only method of delivery possible.

1. Extreme degrees of pelvic contraction.

True conjugate, less than  $2\frac{2}{3}$ ".

Transverse diameter less than  $3\frac{1}{2}$ ".

2. Tumours of the uterus, ovary, rectum or pelvis.
  3. Atresia of vagina or cervix.
  4. Misplacement of uterus e.g., ventrofixation.
- II. RELATIVE—When delivery may be accomplished by other means, but it is preferable to do Cæsarean section.
1. Contracted pelvis—Minor degrees. *Vide* page 162.  
If the head cannot be pushed down into the pelvis at the 37th week.
  2. Placenta Prævia. *Vide* page 190.
    - i. Some cases of central placenta prævia.
    - ii. Presence of some mechanical difficulty.
 Contraindicated in,
    - i. Serious loss of blood.
    - ii. Lateral placenta prævia with breech presentation.
  3. Accidental hæmorrhage—Cæsarean section may be done after opportunity has been given for recovery from shock and the immediate effects of hæmorrhage. If uterine contractions have commenced, it is better to treat by rupturing membranes etc. If contractions are still absent, Cæsarean section may be considered, but it is very rarely indicated.
  4. Hour glass contraction of uterus, or contraction ring. Generally the uterus is infected in these cases. In some of the more difficult cases it may be the only means of delivery possible.
  5. Malpresentation—Associated with pelvic contraction or in elderly primigravida (over 35 years of age).
  6. When mother is dead but child is still alive.  
It must be done within 15 minutes of the death of mother.
  7. Trial labour,
    - (a) In cases when there is no progress of the head for two hours after rupture of membranes.
    - (b) Failed forceps cases. *Vide* page 128.
      - Dangers,
        - i. Shock.
        - ii. Sepsis.
      - If it is certain that the case is septic—Lower segment Cæsarean section is justifiable in a hospital if foetal condition good; otherwise craniotomy.
      - If there is reason to believe that every aseptic precaution had been taken, and the foetal heart sounds are strong and of normal rate, Cæsarean section should be done.
    - (c) Membranes have ruptured for less than 24 hours and only most careful vaginal examinations have been done, Cæsarean section is justifiable.

**TIME OF OPERATION.**

Some day in the week preceding the approximate date of delivery.

If there is uncertainty about the date, it is better to wait until labour starts.

**PREPARATION OF THE PATIENT.**

Castor oil one ounce, 48 hours before.

Skin of abdomen and pubis shaved, washed, cleaned with antiseptics and then painted with tinct. of iodine, covered with sterile gauze or lint and bandaged.

**ANÆSTHETIC.**

Start the anæsthetic when everything and everybody is ready. Use chloroform until the abdomen is opened and then ether.

**Classical Cæsarean Section.****OPERATION.**

Pituitrin injection 2 c.c. intramuscularly, just before the operation is commenced. We prefer to give it just before the uterus is opened into the wall of the uterus itself.

Skin incision—Median or paramedian incision about 6" long, 2" above and 4" below the umbilicus.

Abdominal parietes incised in the same line.

Uterus is pushed towards the centre of the abdomen.

Uterine incision—5" long. The uterus is opened by successive strokes of knife through the upper uterine segment in the middle line.

The assistant with two hands keeps the uterus forward and bulging into abdominal incision by compressing flanks.

If membranes present, they are ruptured.

If placenta presents—Cut through it, taking care not to injure the baby, or peel it off.

Extract the child by grasping the leg.

Assistant brings the uterus out of the abdominal cavity and holds it over the symphysis pubis; or enters hand behind uterus and so tightly can compress the cervix and uterine vessels.

Place a towel in the pouch of Douglas.

Cover the uterus with another towel.

The child is held up when the cord is clamped and divided and the child given to another assistant.

Remove the placenta and membranes. If necessary invert the uterus to peel the placenta off.

If there is excessive bleeding and pituitrin had not been given before, inject 1 c.c. of it into the muscle of the uterus.

See that the cervical canal is not closed by the membranes and can drain freely. We always pass a Fenton's dilator down through the cervix into the vagina which is removed later when all blood clots are swabbed out of the vagina as a routine measure.

**SUTURING THE UTERUS.**

Suture the uterus in two layers.

One layer with silkworm gut—Interrupted stitches  $\frac{1}{2}$ " apart passing through the muscle and peritoneum only and not including decidua.

Second layer with catgut—Needle is inserted  $\frac{1}{4}$ " outside the cut edge.

Interrupted stitches  $\frac{1}{4}$ " apart.

We prefer continuous Lembert suture for the superficial layer.

The uterus is squeezed hard, pouch of Douglas swabbed dry, and then it is replaced.

The omentum is brought down and placed behind the uterus. Abdomen is closed in three layers.

**Modifications of the classical Cæsarean section.****1. LOWER SEGMENT CÆSAREAN SECTION.****TECHNIQUE OF OPERATION.**

A catheter is kept in the bladder.

Skin and the abdominal wall are incised by a vertical incision in the middle line, below the umbilicus.

Peritoneum is incised transversely over the lower uterine segment. Push the bladder down. Inject pituitrin 2 c.c. into wall of uterus.

Open the uterus by a vertical incision, 5" long, in the lower uterine segment; or incise the uterus by a curved incision with its convexity pointing downwards.

Child is extracted with the blade of short forceps or by a finger in the mouth. The easiest way is for the operator to make his right hand act as a vectis.

When the operation is completed, before the patient is put to bed, the vagina is swabbed out with brilliant green 1 to 100, so that no clots remain.

**ADVANTAGES.**

- i. Less liable to infection and less bleeding.
- ii. Lower uterine segment is thinner and therefore easier to stitch. Catgut is used only. The incision is sewn in 3 layers and then the peritoneum is imbricated over the primary lower segment incision using continuous catgut.
- iii. The uterine scar heals better as this part is not contracting and relaxing. There are no adhesions of omentum or gut.
- iv. Infection is not so dangerous and if case is septic a drainage tube is put into each lateral cul emerging at bottom of incision.
- v. We maintain that the scar is better and less liable to rupture in a future pregnancy than the classical scar.

## 2. McCANN OR FUNDAL CÆSAREAN SECTION.

Abdomen is opened by an incision,  $\frac{3}{4}$ rd above the umbilicus and  $\frac{1}{4}$ rd below it.

Uterine incision—Longitudinal incision over the dome of the uterus, half in front and half behind an imaginary line joining the tubes through the central raphe. This is the line of fusion of the embryonic Müllerian ducts and therefore bloodless.

Child is removed with the membranes intact.

Advantages,

- i. Suitable in some cases of osteomalacic pelvis, when there is very little room lower down or the patient has to be operated upon in sitting position. Also we have found it very useful when patient is very fat or œdematous below the level of umbilicus.
- ii. The operation is practically bloodless and therefore especially indicated in placenta prævia. We therefore always use this incision for central placenta prævia.

## 3. PORRO'S OPERATION.

Classical Cæsarean section with supravaginal hysterectomy and fixation of the stump to the abdominal wound. We have never performed this operation as Cæsarean hysterectomy is a better procedure in our opinion.

## 4. CÆSAREAN HYSTERECTOMY.

INDICATIONS.

- i. Sepsis.
- ii. Fibroids, when myomectomy cannot be done.
- iii. Complete intraperitoneal rupture of the uterus.
- iv. Cancer of cervix.
- v. Uncontrollable hæmorrhage.
- vi. Uterus gravely sacculated.
- vii. Placenta accreta.

TECHNIQUE.

After extraction of the child but without necessarily removal of placenta, the tubes, ovarian and round ligaments are ligatured and the broad ligaments are cut through. Peritoneum is incised just above the bladder. The loose peritoneum is peeled off from the lower part of the uterus and the bladder is separated from the uterus until the vaginal wall is exposed. Vagina is opened by piercing it with a knife and the opening is increased by incision round the cervix, (as close to the cervix as possible) until the uterus is free.

The cut edges of the broad ligaments together with the peritoneum reflected from the front of the uterus and the posterior vaginal wall are united with a continuous catgut suture. We never close the vaginal opening. We have most frequently had to perform this opera-

tion in cases seen late and very septic, of severe osteomalacia and in rupture of the uterus—a far from uncommon incident in the tropics. It is an easy operation and can be completed in a few minutes as all tissues are loose.

#### 5. CÆSAREAN SECTION WITH SUBTOTAL HYSTERECTOMY.

After removal of the body of the uterus, the divided peritoneum of the broad ligaments and uterus are united with continuous catgut suture.

#### Cæsarean Section for Septic Cases.

All the modifications that have been introduced are generally intended to combat infection.

In definitely septic cases, subtotal hysterectomy, or total hysterectomy should be done.

In doubtful or cases of mild infection, lower segment Cæsarean section is the best treatment.

The following procedure may be adopted in suspected cases, After opening the abdomen, eventrate the uterus outside the abdominal cavity.

Pack off the peritoneal cavity with towels.

Push the placenta and membranes through vagina.

Swab the interior of the uterine cavity with violet green, eusol or flavine solution or pack with guaze soaked in glycerine the end of which is pushed through the cervical canal into the vagina.

Uterus is then stitched as in classical operation and abdomen closed.

Hobbs' glycerine treatment with catheter stitched to cervix, being commenced at the end of 24 hours. See page 218.

### PROGNOSIS OF CÆSAREAN SECTION.

#### 1. SEPTIC CASES.

DEATH MAY BE CAUSED BY

- i. Shock after exhausting labour.
- ii. General peritonitis.
- iii. Septicæmia.
- iv. Pulmonary embolism.
- v. Intestinal obstruction due to adhesions.

Mortality of mother or child varies according to the time when the operation is done and experience of surgeon.

The mortality increases directly with the interval between the operation and rupture of the membranes, i.e., sooner the operation is done after rupture of the membranes, better the prognosis.

#### II. MORTALITY OF THE CLEAN, ELECTIVE OPERATION ITSELF in tropics is 2·8 per cent. as compared with general mortality of 1 per cent.; so it is two and a half times



higher. The operation, therefore should not be undertaken lightly and without due consideration.

### III. RUPTURE OF THE UTERINE SCAR.

#### **PATHOLOGY.**

If the union is muscular there is very little risk of rupture. If the union is fibrous, it becomes stretched and gets thinned and is very liable to rupture.

Therefore exact apposition of the cut edges is essential to ensure a good and strong scar, and non-absorbable suture material must be used. We always use silkworm gut and unhesitatingly condemn the use of silk.

In cases of rupture after fibrous union, the edges of the scar must be excised to expose the muscular tissue and then sutured, to ensure muscular union.

#### **ÆTIOLOGY.**

More liable after suture with catgut.

Infection of the wound produces a weak scar and most likely if silk is used.

Overdistension of the uterus.

Generally occurs in the last 4 weeks of pregnancy.

**SYMPTOMS**—Rupture of Cæsarean scar usually does not produce acute pain, hæmorrhage or collapse, as no vessels are involved.

#### **TREATMENT.**

##### **Prophylactic.**

Stitch the uterus with silkworm gut and ensure good apposition of the cut edges without any intervention of blood clot etc.

**Curative**—Remove fœtus (dead) from abdomen or uterus and then decide as to the possibility of a future pregnancy or hysterectomy. In the latter do not remove placenta. But if former, invert and turn out placenta before apposing edges.

In case of rupture through a fibrous scar, the edges must be excised to remove the cicatricial tissue. Muscle is exposed and then the wound is stitched.

### IV. COMPLICATIONS AFTER CÆSAREAN SECTION.

#### **I. IMMEDIATE.**

##### **1. Abdominal distension.**

**Meteorism** is a constant complication giving rise to much distress. Our treatment is to give an **enema** of four ounces of pure glycerine 12 hours after operation accompanied by an intra-muscular injection of 1/50 gr. of eserine salicylate and 1 c.c. of pituitrin.

Twenty-four hours after operation a concentrated saline **enema**, i.e., 2 ounces of salt dissolved in one pint of water is given ten minutes after the same intra-muscular injection of eserine and

pituitrin. This will dispel the tympanites and leave the patient comfortable. Thirty-six hours after operation 1½ ounces of castor oil given by mouth.

2. Retention of lochia.

Treatment—Pass a finger through the external os or Hobbs' glycerine treatment.

3. Post-partum hæmorrhage, after operation for placenta prævia.

Treatment—Massage and expression of clots.

• Pituitrin. Ice bag on lower abdomen.

4. Peritonitis, general or local.

Adhesions may form.

5. Utero-abdominal sinus. We had seen this when silk has been used.

6. Intestinal obstruction.

This may occur when the omentum has been put in front of uterus instead of behind at the end of operation. A loop of gut may come down between omentum and anterior wall of uterus and become glued to top of scar and thus a kink occurs as uterus descends and involutes.

## II. REMOTE.

1. Menstrual disturbances.

Excessive loss of blood or subinvolution.

Generally due to sutures passing through the endometrium and getting infected (especially silk).

2. Chronic pelvic pain—Caused by mild sepsis and adhesion with rectum or abdominal wall.

### Post-operative treatment after Cæsarean Section.

Vaginal douching with hot saline is ordered as a routine twice a day. The patient is encouraged to lie on her sides and move her arms and legs freely in order to lessen the chances of embolism and kept in bed for about 18 days.

The baby is put to the breast three hourly.

Otherwise, management is the same as in normal puerperium.

Patient advised to avoid pregnancy for one year.

Abdominal massage and exercises important.

## TROPICAL ÆTIOLOGY AND PROGNOSIS.

It may be noted that during the last 4 years there have been 6,000 confinement cases in the Eden Hospital. A large number of these cases are difficult ones sent to the hospital from outside dispensaries and districts usually late in labour. Out of these, there were 150 cases of Cæsarean section. The following table gives information which may be of value, as they provide a clue to the variety of cases that the obstetrician may meet with in the tropics and indicate the end results which may be expected in hospital cases seen late as a rule in the tropics; whereas

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17 private and therefore clean cases performed during the same period show no maternal or foetal mortality.

Indications.	No. of cases.	Mortality	
		Maternal.	Fœtal.
A. Pelvic Contractions.			
Small round pelvis ...	41	a <sup>7</sup>	4
Contracted outlet ...	15		
Flat pelvis ...	11		
Osteomalacia ...	6		
Robert's pelvis ...	1		
Hip joint disease ...	2		
(Kypho-scoliosis)	—		
	76		

Therefore, Mortality—Maternal ... 9.2 per cent.  
Foetal ... 5.2 per cent.

<b>B. Malpresentation with disproportion.</b>			
L. O. P. ...	6	1	3
R. O. P. ...	19	5	0
Twins ...	3	2	3
Breech ...	9	0	0
Transverse ...	1	0	0
Brow ...	2	1	0
	40	9	6

Therefore, Mortality—Maternal ... 22.5 per cent.  
Foetal ... 15 per cent.

<b>C. Other conditions.</b>			
Atresia of cervix or vagina ...	7	3	4
Heart disease ...	2		
Central placenta prævia ...	4		
Elderly primipara ...	6		
Post maturity with disproportion	6		
Prolapse with pregnancy ...	1		
Fibroid with pregnancy ...	2		
T. B. lungs with pregnancy ...	1		
Toxæmia of pregnancy ...	2		
Eclampsia ...	1		
Acute yellow atrophy ...	1		
Enormous varicose veins of vulva and legs ...	1		
	34		

Therefore, Mortality—Maternal ... 8.8 per cent.  
Foetal ... 11.7 per cent.

Total number of all varieties of cases,—150;  
Mortality—Maternal ... 12.6 per cent.  
Foetal ... 9.3 per cent.

**Variety of Cæsarean Sections performed.**

Variety.	No. of cases.	Mortality	
		Maternal.	Fœtal.
Classical ... ..	23	0	1
McCann (or Fundal) ... ..	8	2	0
Munro Kerr (transverse lower segment incision) ... ..	88	11	7
De Lee (vertical lower segment incision) ... ..	24	4	1
Cæsarean (with hysterectomy) ... ..	7	2	5
	<hr/> 150	<hr/> 19	<hr/> 14
Therefore, Mortality—Maternal ...	12.6 per cent.		
Fœtal ...	9.3 per cent.		

**VAGINAL CÆSAREAN SECTION.****INDICATIONS.**

When mother has to be delivered as quickly as possible and there is no obstruction.

1. Hæmorrhage.
2. Eclampsia.
3. Heart failure.

It is a very difficult and bloody operation if done after the 7th month. Only one has been done in the last 20 years by one of us and though the patient lived repetition of the operation will not occur.

**TECHNIQUE.**

Patient in lithotomy position.

Speculum introduced into the vagina.

Cervix is pulled down with sponge forceps.

Incision through the anterior vaginal wall from below the urethral orifice up to the external os.

Bladder is separated from the cervix and pushed up.

Anterior wall of cervix is divided up to the internal os.

Membranes are ruptured and child delivered with forceps or by breech traction.

Cervix is stitched with interrupted catgut suture.

Vaginal wall is closed with continuous catgut suture.

**CRANIOTOMY.**

Perforation of the fœtal head and its extraction.

**CONTRA-INDICATIONS FOR OPERATION.****ABSOLUTE.**

True conjugate less than 2" or the transverse diameter of the inlet less than 3½".

**RELATIVE**—Undilated cervix.

## INDICATIONS FOR OPERATION.

## ABSOLUTE.

1. Child dying or dead and labour is being delayed, delivery with forceps or by version is difficult.
2. Cæsarean section contraindicated owing to sepsis e.g., "failed forceps" case.
3. Hydrocephalus.
4. Certain malpositions e.g., brow presentation or persistent mento-posterior position, and other methods of delivery have failed.
5. Tonic contraction of uterus.
6. Contracted pelvis and mother refuses Cæsarean section.

## RELATIVE.

Obstructed delivery and mother refuses Cæsarean section.

Operation consists of,

- I. Perforation of head.
- II. Crushing or removal of the vault of head.
- III. Extraction.

## I. Perforation of the head.

Anæsthetic.

Lithotomy position.

If the head is not fixed, an assistant presses it down from the abdomen.

Introduce the left hand into the vagina. Place the tip of the middle finger against the foetal head and keep it in contact with the point to be perforated.

Pass the perforator (Oldham's) along the palm of the left hand and the point is guided to a portion of the scalp which covers bone, preferably the anterior parietal.

Press the handle on the perineum to ensure that the point is at right angles to the foetal head.

Perforate the head by a rotatory movement.

When the bone is perforated, push the instrument inside the skull as far as its shoulder.

Separate the points of the blades by approximating the handles.

Withdraw the instrument slightly, turn it through quarter of a circle and open the blades again, thus making a crucial wound in the skull.

Pass the instrument further inside the skull and destroy the brain (particularly the medulla oblongata) by stirring it up.

And then insert Budin's metal catheter and wash out the brain substance using sterile normal saline.

NOTE—In the absence of a perforator a long sharp pair of scissors is equally serviceable.

## SITES FOR PERFORATION.

VERTEX PRESENTATION—Through the anterior parietal bone.

FACE PRESENTATION—Through the orbit or roof of the mouth, former easier.

**AFTER-COMING HEAD**—Body is pushed up or down and the skull is perforated through the occipital bone.

## II. Crushing the head.

Head may be crushed with Braxton Hick's cephalotribe, cranioclast or Winter's modification of Auvard's three bladed cephalotribe.

### 1. BRAXTON HICK'S CEPHALOTRIBE.

First note the distance between the ends of the handles when the tips of the blades are in contact.

Blades are applied in the same way as forceps, and fixed over the broadest part of the head.

The screw is gradually tightened, taking care that the blades are not slipping, until the tips of the blades are in apposition.

### 2. THREE BLADED CEPHALOTRIBE.

It consists of three parts. The central blade which is pointed, carries the pin of a French lock to which the other two blades can be fixed.

The pointed central blade is marked No. 1; this is passed into the skull as far as possible, the convex surface being kept towards the face.

The blade marked No. 2, is introduced and applied over the face and the two blades Nos. 1 and 2 are tightly screwed together by the compression screw.

If further reduction in size is required, No. 3 blade is introduced and applied to the head on the other side, and screwed on.

### 3. CRANIOCLAST.

It consists of two blades, one solid and the other fenestrated and a crushing screw.

**REMOVAL OF THE VAULT OF THE HEAD.** Rarely employed in these days.

Pass the fenestrated blade between the scalp and the bone.

Introduce the solid blade inside the skull through the perforation.

Blades are locked and screwed tightly.

Tear away pieces of bone by twisting the instrument.

When loose, bring the piece of bone out, guarding it with the left hand.

This is carried on until the vault of the skull is removed.

## III. Extraction.

### 1. CEPHALOTRIBE AND WINTER'S MODIFICATION OF THREE BLADED COMBINED CEPHALOTRIBE AND CRANIOCLAST.

If the head is above the brim, rotate it through quarter of a circle and then deliver.

If the head is in the pelvic cavity, remove any sharp pieces of bone and deliver by gentle traction, keeping one hand in the vagina.

2. **FORCEPS.**

The perforated head may be delivered with forceps. This is very seldom practised.

3. **CROCHET**—It is passed into the cranial cavity or into mouth and traction is applied by it.

4. **VERSION**—After perforation, podalic version is done, and the child is extracted by breech traction.

5. **A FINGER** may be passed, through the perforation or into mouth and traction is applied by means of it.

6. **CRANIOCLAST**—Pass one blade inside and the other outside the skull, and then extract the head by steady pull.

7. **AFTER REMOVAL OF THE VAULT OF HEAD.**

Induce face presentation and deliver by traction with crochet or vertebral hook.

After extraction examine carefully for lacerations of the soft parts and loose pieces of bones.

**NOTE**—The maternal mortality of the mutilation operation is very high in the tropics. Over 20 per cent. die of shock, hæmorrhage, sepsis and many are permanently injured by inoperable fistulæ or have to have operations of repair in the future. For these reasons a time will arrive when the public will see the advantages of antenatal care and clinics, a time when ignorance, prejudice and carelessness will be condemned rather than valued as at present.

## EMBRYOTOMY.

Operations used for reducing the size or altering the shape of the foetal body.

1. Decapitation.
2. Evisceration.
3. Cleidotomy.
4. Spondylotomy.
5. Amputation of legs.

## DECAPITATION.

Severing the neck of the child.

### Indications.

1. Neglected shoulder presentation.
2. Certain cases of locked twins.
3. Double monsters.
- 4 If, in the case of a macerated child, the leg comes off on attempting version.

**Operation.**

Neck is fixed by pulling the prolapsed arm down.

If the hand is not prolapsed, an assistant presses the foetus down per abdomen.

Left hand is passed into the vagina, and the palmar surface is placed against the neck.

Decapitating hook (Ramsbotham's) is passed along the palm of left hand and is guided by the latter over the neck. When the hook is in position, see that its point is free.

Neck is divided by a rocking movement of the instrument.

Body is delivered by traction on the prolapsed arm or by crochet.

Head is usually delivered spontaneously. Or, a finger may be passed into the mouth and head delivered. Alternatively, forceps may be applied and the head delivered.

If there is difficulty in delivering the head, it may be crushed with cephalotribe or cranioclast and then extracted.

**DANGERS.**

1. Injury of the bladder.
2. Injury of the lower uterine segment.

**OTHER METHODS.**

- i. The neck may be divided with a strong pair of scissors.
- ii. Neck may be fractured by twisting it with blunt hook and then cut with scissors.
- iii. The neck may be cut with wire or whip-cord.

**EVISCERATION.**

Opening the abdomen or thorax and removal of viscera.

**INDICATIONS.**

1. Abdomen or thorax of the child over the internal os.
2. Large size of the foetal abdomen obstructing delivery.

**OPERATION.**

Body is fixed by traction on the prolapsed arm or pressure from above.

Left hand is passed into the vagina until the fingers reach abdomen or thorax.

Abdomen or thorax is opened by cutting it with sharp pointed scissors, guided by the vaginal hand.

Viscera are removed with the left hand.

Child extracted by blunt hook or crochet.

**SPONDYLOTOMY.**

Extraction after division of the spine.

**INDICATION**—When the neck cannot be reached for decapitation, or the body cannot be delivered after evisceration.

**OPERATION.**

Left hand is passed into the vagina and the most prominent part of the spine is selected.



Spine is divided with a strong pair of scissors, being guided by the vaginal hand.

Upper half of the body is delivered by traction on the arm, and the lower half by traction on the leg.

### CLEIDOTOMY.

Division of clavicle.

INDICATION—When birth is obstructed owing to large size of the shoulders.

#### OPERATION.

Left hand is passed into the vagina and a finger is placed on the clavicle.

Clavicle is divided by a strong pair of scissors, being guided by the vaginal hand.

Body is delivered by traction on the head or leg.

## DRUGS USED IN OBSTETRICS.

### PITUITARY EXTRACT.

It contains two active principles,

1. Pitocin or oxytocin—Part which excites uterine contractions.
2. Pitressin or vasopressin—Part which causes rise of blood pressure and has no action on the uterus.

#### ACTION ON UTERUS.

It acts on the uterus just before labour starts and during labour only. Before labour, uterus is very slightly susceptible to the drug.

The increase of pain lasts from 30 to 50 minutes only. A second dose has less effect.

#### Indications for use and dose.

##### I. INDUCTION OF LABOUR.

When combined with castor oil, enema and quinine, it is useful as an auxiliary in induction of labour.

II. In certain cases of antepartum hæmorrhage and other hæmorrhages from the uterus e.g., hydatidiform mole.

##### III. DURING LABOUR.

1. Irregular contractions of the uterus e.g., colicky uterus.
2. Weak pains in second stage, labour being entirely normal otherwise.
3. To arrest hæmorrhage in the third stage. No danger of hour-glass contraction.
4. During Cæsarean section, to ensure good uterine retraction.

#### Dangers of using pituitary extract.

1. INJURY TO THE GENITAL CANAL if administered before the full dilatation of os.
2. RUPTURE OF UTERUS if there is obstruction.
3. POST PITUITARY SHOCK—When the second dose is repeated within an hour of the first dose.  
CAUSE—Probably caused by spasm of coronary artery.  
SYMPTOMS—Marked pallor, failing pulse and collapse.  
TREATMENT—Injection of camphor in oil or ether, adrenaline, strychnine and warm saline transfusion.
4. INJURY TO THE CHILD'S HEAD, as there is very little time for moulding, intracranial hæmorrhage may occur.

**Dosage.**

One c.c. usually contains 5—10 units.

First stage—Never give more than 2 units (3 minims).

Second stage—Maximum, 5 units.

After delivery for postpartum hæmorrhage—Maximum 10 units.

**ERGOT.**

Active principles which act on the uterus—Ergotoxin and ergotamine.

Liquid extract of the British Pharmacopœa does not contain these but acts efficiently. Therefore probably some undiscovered principle causes uterine contraction and retraction in the liquid extract.

If the extract is made with alcohol these are extracted.

The liquid extract of British Pharmacopœa contains a small amount of histamine.

Good ergot preparations.

1. Ergodex (B.D.H.) 1 teaspoonful B. D.
2. Fermergin—Contains ergotamine. It can be given by the mouth or hypodermically, dose 1 c.c.
3. Ernutin (Burroughs Wellcome)—Contains ergotoxin. Dose 1 c.c.
4. Aseptic ergot (Parke Davis), Dose 1 c.c.

It should only be used when the uterus is empty, to ensure arrest of postpartum hæmorrhage or good uterine retraction.

## CHAPTER IV.

### USE OF X'RAY'S IN OBSTETRIC PRACTICE.

The introduction of Potter-Bucky diaphragm has made X'ray diagnosis of obstetric cases possible.

#### Uses.

1. Pelvic measurements are of great importance in doubtful cases *e.g.*, early osteomalacia, flat pelvis, funnel pelvis.
2. Diagnosis of pregnancy.  
Pregnancy may be diagnosed as early as the 12th week.  
Twins and triplets can be diagnosed.  
Negative picture may confirm the diagnosis of hydatidiform mole.  
If the skeleton cannot be demonstrated by the 20th week, it can be safely deduced that the pregnancy is not normal.
3. Presentation, position and lie of the child and the degree of flexion of head.
4. Relation of the foetal head to the brim or whether extended legs in a breech.
5. Foetal abnormalities as monsters, hydrocephalus etc.
6. An idea of the degree of maturity can be gained from the ossific centres *e.g.*, astragalus or os calcis (28th week) or the lower epiphysis of femur (40th week).
7. Diagnosis of foetal death—Overlapping of the bones of skull, and distinct shrinkage of the contents.
8. Mechanism of labour can be easily followed on X'ray screen and would be useful for teaching obstetrics.
9. Diagnosis of injuries to pelvis or foetal skull after labour, *e.g.*, fracture or separation of epiphysis or diastasis of symphysis pubis.
10. Extra-uterine abdominal or cornual pregnancy may be differentiated from a fibroid,  
(a) Ovarian or tubal tumour.  
(b) Intrauterine pregnancy, by pneumo-peritoneal technique.
11. Fibroid plus pregnancy or dermoid.
12. Pregnancy in cases of old tuberculous hip or spine.



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